Northern Lights Azaleas

Tadeusz Dauksza—Orland Park, Illinois

"So much owed by so many to so few."

—Winston Churchill August 20, 1940

Maybe this phrase can also be used in directing a special gratitude to those before us who introduced the world of azaleas to us. So few like the Army bookkeepers in 1915-1920 who entered "GI" when entering articles into their log books. (The term stood for "Galvanized Iron" and the letters were originally stamped on U.S. Army metal trash cans. Later, the assumed abbreviation was "Government Issue" and it was stamped on all articles issued. Eventually the term evolved to describe the soldiers themselves.)

So few like the American Legion (a veterans group) who is responsible for many of the provisions of the Service Readjustment Act of 1944 (better known today as the GI Bill) signed into law by President Franklin D. Roosevelt.

So few like Al Johnson and Leon Snyder (professors and researchers) who had the vision, foresight, and dedication to pour their hearts and souls into creating a place where "Northern" gardeners could learn and enjoy the beauty of hardy ornamentals.

You might be wondering what this has to do with the Northern Lights series of azaleas. Let's continue for a moment.

One of the greatest surges of interest in home landscaping and the use of ornamentals followed the post World War II housing boom. Young GIs returning from overseas turned their attention to education, careers, families, and homes. Thanks to President Roosevelt's GI Bill, these dreams were made possible through free education and guaranteed home loans. (An important provision of the bill was the availability of a low interest, zero down payment home loan for servicemen.) This enabled millions of American families to move out of urban apartments into suburban homes.

Prior to the war, primarily wealthy and upper-class families lived in the suburbs. However, the GI Bill democratized the "American Dream." It was one of the most significant pieces of legislation of the 20th century.

Within a few years, the suburbs were filled with newly constructed homes on barren, muddy lots. The sense of a victorious period which filled Americans during the economically strong, post-war period inspired homeowners to turn their new homes into comfortable, attractive showplaces. Plus, the babies being born at record pace needed a place to play. The American love affair with the lawn began.

In her entertaining, enlightening, and nostalgic book, *Minnesota Gardens*, Susan Davis Price writes: "Generous weed-free lawns typified the post-war years. A well groomed carpet of grass outdoors was an extension of the plush, indoor



▲ 'Tri- Lights'
▼ 'White Lights'



wall-to-wall carpeting in newly built ranch-style homes."

Not only did grass feel good under the feet, it looked good and solved the problem of what to do with all the space around the house. It also gave the kids a soft landing when they played.

Condensed from a University of Minnesota Extension publication and featured in the April 1953 *Minnesota Horticulturist* (now *Northern Gardener*), Leon Snyder proclaimed: "A good lawn is the most important single feature of any home landscape. It's like the canvas on which an artist



▲ 'Mandarin Lights'

▼ Lilac Lights™ ('UMinn's Lilac Lights')



paints his picture—a pleasant background for the flower and shrub border and the cool shade of the lawn trees."

What were homeowners covering their blank canvases with?

In most cases, annual flowers accented with a few shrubs and evergreens were planted to relieve the appearance of the house and its landscape from bareness. Some of the favorite colorful annuals included zinnias, marigolds, petunias, asters (all colors, but most notably yellow), ageratum, pansies, violas, phlox, salvia, and verbenas.

Color ruled as homeowners began to concern themselves with how the landscape appeared from the inside as well as to the passerby. The colorful annuals were grouped in masses and arranged in harmony, providing a pleasing decoration for the house.

So, were people planting anything but annuals in Minnesota and the Midwest? You bet they were. Daylilies, iris, mums, and peonies were the frequently reported perennials with a particular emphasis on roses. (My mother introduced me to the propagation of roses using clear jars as a means to duplicate some of her favorite beauties.) Flowering shrubs such as lilacs, mock orange, honeysuckle, and spireas led the pack of woody plants.

Minnesota Landscape Arboretum Project

It's easy to see why nearly every pre-1970s yard has a trio of bridal wreath spirea, lilacs, and peonies. The tree with the most buzz appeared to be the "Radiant" flowering crab introduced by the University of Minnesota in 1958. It was described as "compact and upright in growth habit with sturdy, wide angled crotches. This form makes the variety ideally suited for landscape purposes on smaller properties." The foliage had a reddish cast, the flowers a deep pink, and the fruits stayed on the tree to feed the birds in the winter-time.

The executive committee of Minnesota State Horticultural Society (MSHS), prompted by the Men's Garden Club of Minneapolis (an affiliated garden club of MSHS), recognized the ever-growing interest in hardy ornamentals. Together they determined there was a fervent need for further research and development, as well as a place where northern gardeners could observe these plants in their ideal settings. The committee passed a resolution in 1955 to sponsor the Landscape Arboretum Project.

The project had five objectives: (1) to intensify research for hardy ornamentals; (2) to create interest in existing and new plant materials; (3) to provide a living library for study of ornamental plants; (4) to demonstrate proper utilization of Minnesota ornamentals; and (5) to promote further testing and use in all areas of the state.

Major fundraising to make the arboretum a reality was soon underway. With numerous private donations and a large sum raised by the Lake Minnetonka Garden Club (an affiliated garden club of MSHS), the society purchased 160 acres of land across from the University of Minnesota Fruit Breeding Farm in Chanhassen, Minnesota. A year later it turned

the deed over to the university with the understanding that the objectives set forth by the society would be carried out. The Minnesota Landscape Arboretum was born.

Dr. Leon Snyder was named the arboretum's first Executive Director. In 1958, it was a little-known horticultural research station sitting on 160 acres of marshland. Fifty years later, the arboretum (http://www.arboretum.umn.edu) has blossomed into an international research center and cultural destination that contributes to the horticultural, economic, and intellectual lives of people all around the world.

The arboretum boasts 16,500 members, 1,400 volunteers, and nearly half a million visitors each year. With more than 1,000 acres, 32 display and specialty gardens, 48 general plant collections, and more than 5,000 plant species and varieties, the arboretum is one of the premier horticultural field laboratories and public display areas in the Midwest.

In 2004, the Woody Landscape Plant Breeding Project at the University of Minnesota celebrated 50 years of active breeding and development of cold-hardy woody landscape plants. Initiated in 1954, the project is a latecomer relative to other horticultural plant breeding efforts at the University of Minnesota (fruit breeding beginning in 1888, vegetable breeding in 1901, and flower breeding in the 1930s). Like all of the horticultural breeding efforts at the university, the Woody Landscape Plant Breeding Project was initiated to breed and develop woody landscape plants capable of thriving in Minnesota's harsh winter climates, which range from USDA Plant Hardiness Zone 4B in the south to Zone 2B in certain locations in the north. The project has been responsible for the release of more than 40 plant cultivars and has contributed to the development of the state's \$2.1 billion nursery.

Evaluations and selection for cold hardy, adapted landscape plant materials has been ongoing at the University of Minnesota since 1888. That year Professor Samuel B. Green was hired as the head of the Department of Horticulture. He planted trees and shrubs on the university's St. Paul campus to evaluate cold hardiness and landscape quality.

The first directed breeding work on woody landscape plants dates back to 1942 when Dr. Louis E. Longley started the chrysanthemum breeding project. He also began making crab apple and rose crosses. Longley is credited with releasing four roses: 'Pink Rocket', 'Red Rocket', 'L.E. Longley', and 'White Dawn'. He also developed the 'Radiant' crab apple. After Longley's retirement in 1949, Robert A. Phillips continued making rose hybridizations. Two additional cultivars, 'Prairie Fire' and 'Viking Queen', are attributed to Phillips.

The Woody Landscape Plant Breeding Project's original leader was Dr. Leon C. Snyder, who cites the formal initiation of the project as occurring in 1954. Snyder was the driving force behind the early efforts in the project. Thus his legendary interest in evaluating plants for potential use in the Minnesota landscape led to an explosion of plant breeding which continues to this day. Dr Snyder retired in 1976.

At the formal inception of the Woody Landscape Plant

Breeding Project, Snyder was head of the university's Horticultural Science Department. Given his administrative duties, Snyder certainly had to delegate much of the responsibility for day-to-day breeding and evaluation activities.

Richard Stadther was hired by the university in 1954 as an instructor in ornamentals and was cited as working for the Woody Landscape Plant Breeding Project until he left the University in 1961. Dr. Robert Mullin was hired in 1963 to replace Stadther, and is credited by Dr. Leon Snyder as working on the project in the early years. Like Stadther, Dr. Mullin was stationed on the St. Paul campus and thus physically removed from the day-to-day breeding and evaluation work which has always been carried out at the Horticultural Research Center in Excelsior, Minnesota.

In 1957, Albert Johnson was hired to work on the breeding project at the Minnesota Landscape Arboretum. Until his untimely death in 1977, Johnson carried on the day-to-day activities of the project. In 1957, Johnson made the first crosses that signaled the beginning of an effort that largely defines the project to this day, the Lights azaleas.

Johnson's activities extended far beyond the arboretum as he scoured the state and region in search of new, unique woody plant materials. Many of these "hunting" trips were done in collaboration with extension agents Mike Zins and Mervin Eisel who spotted much of the plant material in their extension travels. To this day, the project continues to evaluate plant materials collected by this enterprising group of "plant hounds," including a columnar form of bur oak (Quercus macrocarpa) and a hardy Kentucky wisteria (Wisteria macrostachys).

Gardeners, nurserymen, and the landscape industry throughout Minnesota owe much to these largely unheralded individuals and their ceaseless effort to being new plants into commerce.

In 1978, Dr. Harold Pellett assumed leadership of the Woody Landscape Plant Breeding Project. Pellett had been on the faculty since 1967 working in the area of nursery production and whole plant physiology. Under his leadership the project truly blossomed with more than 30 woody landscape plants being named and released as cultivars.

In addition to productive efforts in cultivar development, Pellett also collaborated in some pioneering research regarding woody plant cold hardiness. Dr. Pellett retired from the University in 2001 and Dr. Stan Hokanson was hired to take over leadership of the project.

More than 40 cultivars have been released by the university and Woody Landscape Plant Breeding Project. The list includes several flowering crab apples, apricots, and plums released in the 1920's, 30's and 40's, predating any directed efforts at woody landscape plant breeding or selection. These early releases were by-products of the fruit breeding program which was initiated in 1888.

The woody landscape plants released by the project can be categorized into five groups: large trees, small flowering trees, shrubs, deciduous azaleas, and roses. The diversity of cultivars released from the project reflect early efforts to identify woody plants with meritorious landscape characteristics and the capacity to survive Minnesota winters. Simply stated, the objective was to expand the palette of landscape plant offerings for the state and environments. Early efforts largely involved evaluation of vegetatively propagated genotypes and seedling populations arising from plant taxa, genotypes, and/or populations of interest.

Aside from the short-lived rose and crab apple breeding programs of the 1940's, no purposeful hybridization programs were undertaken with woody landscape plants until the onset of the formal breeding program in 1954. The aim of the program was devoted to breeding or developing cold hardy deciduous azaleas and shrubs for Minnesota and other regions with cold winter climates. Previous to the initiation of the project, there were few azalea cultivars with a wide selection of colors available which bloomed reliably in the Midwest area, especially Minnesota.

Cold Hardiness

Cold hardiness was not a simple characteristic for which to breed. Genetic and environmental factors interact to determine the cold hardiness of a plant at any particular time. As natural daylight decreases in late summer and autumn, a particular day length (or photoperiod) is reached to which plants respond by cessation of growth and development of increased ability to tolerate temperatures slightly below freezing. Thus begins the first stage of cold acclimation.

The critical photoperiod is genetically determined for each plant and is related to the latitude of the plant's native area of origin. In general, woody plants from northern latitudes or higher elevations cease growth at longer day lengths, which means they start acclimating earlier in the summer than woody plants from more southern latitudes which respond to shorter day lengths and therefore cease growth later in the year. In summertime in Northern Minnesota, the sun is still visible at 9 p.m.

The second stage of cold acclimation is induced by decreasing temperatures and is often triggered by frost. This stage is characterized by rapid acclimation which enables plants to tolerate low winter temperatures. Again genetic control plays a big part. Generally, plants native to cold climates are capable of tolerating lower temperatures than plants native to warmer areas.

Cold de-acclimation may be another factor influencing the cold hardiness of azaleas. De-acclimation occurs if plants are exposed to warm temperatures. Injury to the plant may result if it subsequently experiences very low temperatures. Results from cold hardiness research done at the University of Minnesota indicates that azalea buds de-acclimate rapidly at room temperature and can lose several degrees of hardiness in as short of time as one hour (1).

Cold hardiness also varies in different tissues within an individual plant. In most woody plants, root tissue is the least cold hardy. However, since root tissue is protected by the latent heat of the earth, it is not often exposed to killing tem peratures.

Northern Lights' Azalea Breeding Program

Of most concern in deciduous azaleas is the cold hardiness of the flowers, since they are the least cold hardy exposed plant tissue and floral display is the primary reason for growing azaleas. Thus the first step of the breeding program was to identify desirable parental material which had the ability to contribute cold hardiness to its offspring. Most of the cold hardy material was selected from the more northern part of the species range or from hardier strains. Some of the plants identified as cold hardy included individuals from the following species: *Rhododendron prinophyllum, R. vaseyi, R. canadense, R. viscosum, R. arborescens, and R. x kosterianum.*

Other materials included in the breeding program were chosen for cold hardiness and desirable characteristics such as color and floriferousness. These included: Knaphill hybrids, Exbury hybrids, R. calendulaceum, R. japonicum, and R. luteum.

In 1957, Albert Johnson crossed *Rhododendron* x *kosterianum* (Mollis azaleas – Galle page 84) with *R. prinophyllum* (Roseshell azalea), initiating the most well-known work of the project—development of the Lights series of deciduous azaleas. The resulting seedlings of the controlled crosses were sold under the name Northern Lights F1 hybrids. They were quite uniform in size and form. The flower bud hardiness was consistent at -45° F and the flower color ranged from light pink to dark pink. Most of these hybrids were sterile.

The first plants of the Northern Lights Group were released in 1978. The Northern Lights series of azaleas bud cold hardiness was tested and confirmed in a laboratory environment. Laboratory tests confirmed the flower bud hardiness of the selection and determined the lowest temperatures the buds could withstand.

To date, 14 named cultivars have been released by the project. The overriding objective of the azalea breeding program has been development of USDA Zone 4 hardy azaleas in a range of colors. Although nearly commonplace in Minnesota and Midwest landscapes today, the range of colors and flower forms represented by the Lights azaleas were unknown as recently as the mid 1980's when some of the richer yellow, orange, and multi-hued cultivar began to find their way into the landscape. It would be an understatement to say the program has been a success.

'Pink Lights'

'Pink Lights' was introduced in 1984. It is a clonal selection from R. x kosterianum x R. prinophyllum. It is an extremely floriferous plant with mature height of six to eight feet in 24 years. Flowers are pale pink with darker pink blotch. The flower buds are hardy in mid-winter to -45° F with no injury. Crossed (1957), raised, and introduced by Dr. Harold Pellett, University of Minnesota, Landscape Aroretum, Chaska, MN.

'Rosy Lights'

'Rosy Lights' azalea is a dark pink clonal selection from R. x kosterianum x R. prinophyllum. It also has mature height and spread of six to eight feet. Flowers are sterile. It was introduced in 1984. It blooms in late May. Hardy to at least -40° F. Crossed (1957), raised, and introduced by Dr. Harold Pellett, University of Minnesota, Landscape Arboretum, Chaska, MN.

'White Lights'

'White Lights' azalea is a clonal selection from seed-lings having *R. prinophyllum* and some white Exbury in the background. Flower buds of 'White Lights' are a pale, delicate pink in the balloon stage. Upon initial opening, the flowers have a faint pink tinge which fades at full bloom to give virtually a white appearance in the landscape. Flower buds are hardy to -35° F. 'White Lights' has a spread of four to five feet. The flowers are sterile. It was introduced in 1984. Crossed (1969), raised, and introduced by Dr. Harold Pellett, University of Minnesota, Landscape Arboretum, Chaska, MN.

'Orchid Lights'

'Orchid Lights' azalea was introduced in 1984. It was selected from cross of *R. canadense* x *R.* x *kosterianum*. It has smaller, moderate purplish pink colored flowers blooming mid-May on a compact dense shrub reaching three to four feet in height and spread. Flower shape is unique as it is intermediate between the two parents.

'Orchid Lights' is extremely hardy and flower buds can withstand -45° F without injury. It is sterile, setting no seed pods even though stamens and pistil are present. Flowers are somewhat obscured by new foliage, and it has a little bit of "skunky" odor. Crossed (1962), raised, and introduced (1984) by Dr. Harold Pellett, University of Minnesota, Landscape Arboretum, Chaska, MN.

'Golden Lights'

'Golden Lights' is a clonal selection from seedlings having *R. atlanticum* and Exbury azaleas in its background. The cross was made in 1975, introduced in 1985, and named by Dr. Harold Pellet and Susan Moe. The plant matures at five to six feet in height and spread. It produces a floral display of golden-colored flowers in May. 'Golden Lights' flowers are fertile and fragrant.

'Apricot Surprise'

A deciduous azalea, parentage uncertain but probably *R. calendulaceum* open pollinated. Hybridized (c. 1958), raised, introduced (1987) and registered (1991) by University of Minnesota Landscape Arboretum. Named by Dr. Harold Pellettt.

Flowers are moderately fragrant, widely funnel shaped with narrow tube, the corolla is vivid yellow, with vivid orange-yellow markings covering most of upper petal. The shrub is moderately floriferous four to five feet high and five to six feet wide in 30 years. It has an upright growth habit, and it is bud hardy to at least -25° F.

'Spicy Lights'

'Spicy Lights' is a cross of *R. prinophyllum* x unknown. The cross was made in 1963, and it was raised and introduced in 1983. It was named by Dr. Harold Pellett and Susan Moe. It feature salmon orange flowers, and it is fragrant. Leaves in the fall have slight "purpling." Grows to five to six feet tall in 20 years.

'Northern Hi-Lights'

Introduced in 1994, 'Northern Hi-Lights' is a (1978) hybrid of *R. atlanticum* hybrid x unidentified Exbury seedling. It has the same parents as 'Golden Lights'. The flowers are creamy white with a bright yellow upper petal. It has a cold hardiness rating of -30° F. Plants grow relatively slowly to a height of four feet and a spread of four to five feet. The dark green foliage has some resistance to mildew.

'Mandarin Lights'

Blooming in early spring, its flowers are bright orange red with a light fragrance. Narrow tubular funnel-shaped blooms with wavy edged lobes. The upper lobe is more ruffled than others. Parents are *R. calendulaceum* x 'Orangeade'. It was hybridized in 1967 and registered in 1994. Developed at the University of Minnesota Landscape Arboretum in Chanhassen.

'Lemon Lights'

Introduced 1996, 'Lemon Lights' is a 1978 hybrid of an unnamed cross between an Exbury hybrid seedling and another hybrid with *R. atlanticum* heritage. It has wavy edged lobes and brilliant yellow color with a vivid orange-yellow blotch on upper petal. Slight scent and very floriferous. It was registered in 1995.

'Tri-Lights'

A 2004 addition in the Northern Lights Series, it is a hybrid of a *R. atlanticum* selection by an unnamed red-flowered Exbury azalea. At maturity, it is approximately five feet tall and six and one half feet wide. The tri-colored flowers have marbled pink and white petals with orange-yellow speckles in the throats. Leaves are dark green and resistant to powdery mildew. The vegetative tissues of 'Tri-Lights' are hardy to -30° F, while the flower buds are hardy to about -25° F. Hybridized in 1978, it was grown, named, and registered in 2000.

Lilac LightsTM ('UMinn's Lilac Lights')

A new addition to the Lights Series of hardy deciduous azaleas, Lilac LightsTM was introduced in 2005. It is an improved version of 'Orchid Lights' resulting from a controlled cross of R. canadense x (R. x kosteranum x R. prinophyllum).

In 10 years, it matures to approximately five and one

half feet tall and four to five feet wide. Blooming in mid to late May, it has numerous lax trusses, each holding eight to 10 flowers. The corolla is five-lobed. Lower lobes are narrow and deeply divided, while the upper three lobes are less deeply divided. Flower color is medium pinkish purple with darker speckles on upper lobes. Flowers are not fragrant. Foliage is medium green.

Candy LightsTM ('UMinn's Candy Lights')

This new cultivar restores pink to the color palette of the Lights Series of hardy deciduous azaleas. An earlier cultivar, 'Pink Lights', has been too difficult to propagate in commercial quantities and has therefore become unavailable in the trade. Candy LightsTM results from a controlled 1989 cross of R. atlanticum and a red-flowered R. x kosterianum.

Candy Lights™ is a medium sized shrub, growing five to six feet tall and wide. It blooms in mid to late May with many dome-shaped flower trusses, each holding eight to 10 flowers. Flower color is a clear light pink with pale yellow streaks on the upper corolla lobe. Flowers have heavy substance and are strongly fragrant. Foliage is medium to dark green.

'Western Lights'

'Western Lights' is a polyploid form of the tried-andtrue standard 'Orchid Lights'. It boasts thicker, more lush foliage with a slightly glaucous tone and larger flowers. The good, deep purplish pink coloring is still present, but the entire plant is a lot showier from bud to foliage.

It was introduced by Briggs Nurseries and it was their 2001 Plant of the Year. Parentage is (R. canadense x R. x kosterianum). The one and a half inch orchid-colored flowers are sterile.

Work on the hardy deciduous azaleas continues. One color that's missing from the Lights Series so far is red, and they are looking at several good red-flowering azaleas for introduction in the near future. Project leader Dr. Stan Hokanson likes one of the advanced selection azaleas that has double flowers in a pink-coral shade, so there may be a 'Double Lights' down the road a bit as well.

Another new project effort is directed toward the development of powdery mildew resistant deciduous azaleas. As an initial step in the process, the screening of 41 deciduous azalea cultivars is being done in replicated field plots in Minnesota and Ohio to identify mildew tolerant or resistant cultivars for use in future breeding efforts.

Liner-sized plants of most of the cultivars being screened in the field are also being screened in growth chamber experiments. They want to determine whether the same resistance/susceptibility reactions occur in the growth chamber as are observed in field experiments. If this is the case, they can accomplish powdery mildew screening on a smaller scale, in the off-season, at a cost savings to the breeding project.

Future work will involve screening seedlings collected from populations of 16 species of deciduous azaleas native to the Appalachian Mountains of Eastern United States. For those fortunate to visit the Twin Cities, do stop at the tiny town of Buffalo where Erva Hance (daughter of the late Horticulture professor Leon Snyder) has close to 1,000 iridescent Northern Lights azaleas that stop the rural traffic once they are abloom.

To obtain some of these Northern Lights series of azaleas visit these nurseries which have mail-order operations. Or, for further information feel free to write or call the author.

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UPDATE: Hybridizers— Leave your Legacy

James Thornton—Conyers, Georgia

In the spring issue of *The Azalean* (Vol. 30, No. 1), I penned an article "*Hybridizers: Leave your Legacy*." If you recall, it was a request for hybridizers to help build a data base of the specifics of their hybrid plants. This data base would create a library of sorts, for all azaleaphiles, present and future—of information concerning the creation of their azaleas.

The article even included a form to use to submit data. It seemed simple enough, even though I was forewarned by Galle that in his quest for data it was "difficult, sometimes hopeless, an enormous task" and often "frustrating." Boy, these were understatements if there ever were ones. I was so optimistic!

Later in the fall issue (Vol. 30, No. 3) I gave a status report. Other than **David Purdys**' input, there was nothing to report! In that article, I went into a tirade as to why there where no responses, accusing our hybridizers of many things, including "plain old apathy." I went on to say that I would still be around as along as my patience held out.

I have to admit my patience was wearing thin when along came plant data from hybridizer **Joe Klimavicz**. I know all of us are aware of his work and those who attended this year's convention eagerly sought after his plants. Some, however, went away empty handed, including myself!

Anyway, thanks to Joe and David, maybe just maybe, this will prompt others to share their plant data, and it will not fade into the world of "never, never land." Like the motel ad says, "I'll leave the light on for you!"