The Klimavicz Hybridizing Project—
Magic in the Making

By Carolyn Beck—Oak Hill, Virginia

Hybridizing, in my mind, is magical process, and Joseph (Joe) Klimavicz is a real wizard when it comes to creating new azalea cultivars. This is the story of his journey through a project that has covered the last 25 years.

Evolution of a Passion

The roots of Joe's passion for azaleas run deep. It began when his parents gave him a small plot in the backyard in which to grow vegetables. Raising plants from seed and producing something for the family table gave him a great sense of satisfaction. As time went on, his interest in plants expanded. He became fascinated when his father showed him that azaleas could be grown from cuttings; this information was put to good use when he had a garden of his own and wanted to grow azaleas for his landscape.

In 1989, Joe came across a local Springfield, Virginia, newspaper article about Bob Stewart, a man in the neighborhood who collected azaleas and was hybridizing them. Joe was intrigued, contacted Bob and arranged for a visit. As they walked through the garden, looking at the huge number of cultivars that Bob had acquired, they talked about what was involved in making a cross. One of the azaleas that Joe most admired during that outing was 'Satellite', a Belgian Indian type with blooms in stunning shades of bright pink with some irregular areas of white. Joe took home a flower that Bob had given him and placed its pollen on an 'Elsie Lee' that was in bloom. The inspiration from Bob and the enjoyment derived from this impromptu venture has continued through to the present.

Another wonderful outcome of that first encounter with Bob Stewart has been a lasting friendship with much sharing of information. Joe is also thankful for the mentoring by other azalea enthusiasts like George Ring, Don Voss, Pete Vines, and Don Hyatt.

Setting Goals

The hybridizing process typically starts with the formation of objectives important to the breeder, and hopefully to the azalea community as a whole. Typically the breeder is looking for something that is unique with dynamic flowers, outstanding foliage, a pleasing plant habit, and hardiness. Besides having that "WOW! Factor," Joe considers the following traits to be desirable:

- Colors that are clear and consistent; no fading in the sun or over time
- Striking patterns such as heavy variegation, bi-colors, and prominent blotches
- Strong pedicels, which allow the flowers to hold their heads up high; no floppiness

Photo Carolyn Beck

▲ Joe Klimavicz in his backyard surrounded by azaleas he has cultivated during the past 25 years.

- Abundant bud set and bloom with most flowers opening at the same time and abscising cleanly
- Early-to-midseason bloomers to avoid the scourge of petal blight (*Ovulinia azaleae*)
- Forms that are both consistent and uncommon, like doubles with high petal counts (no petaloidy), variegation, and multiple patterned flowers on the same plant
- Long lasting bloom quality
- Heavy substance

Because an azalea is often in bloom for only a couple of weeks, it is essential that the foliage be of considerable interest to justify the plant's place in the landscape. Joe looks for the following qualities in the leaves:

- Dark green, with a glossy surface
- Fall color, especially bright red and dark burgundy
- Heavy texture

▲ Parents of 'Bob Stewart'. At left is CL-95-81 and at right is 'James Stewart'.

▼ 'Bob Stewart'

In striving for a plant that will make a statement in the garden, Joe searches for those specimens that require a minimum of care and exhibit:

- A vigorous and compact habit that requires little or no pruning to maintain an attractive shape
- The ability to tolerate diverse and adverse growing conditions, such as drought, excessive rain, a wide pH range, and poor soil
- Hardiness and heat tolerance
- Disease and insect resistance

Selecting Parents

Selecting potential parents is the second step in the hybridizing process. It is usually winter when Joe finds time to reflect on which azaleas might make the best parents. In his mind he examines those that have the most potential for producing progeny consistent with his goals. He traditionally uses hybrids, rather than species, because they offer a more diverse gene pool, and he tends to choose parents with complex flower forms and color combinations for the same reason. From the hundreds of crosses he has made, Joe has found the following to be exceptional parents:

- 'Festive' (Glenn Dale) and 'Florence Waldman' (Roslyn) - variegated
- 'Satellite' (Belgian Indian by Klupenger) - variegated semidouble and double flowers with frilled edges
- 'Leopold Astrid' (Australia and New Zealand) - bicolor with double flowers and frilled edges
- 'James Stewart' (Stewart) and 'Komo Kulshan' (Kiusianum hybrid) - bicolors
- 'Carol Kittel' (Marshy Point) - double bicolor
- 'Elsie Lee' (Shammarello) and 'Girard's Fuchsia' (Girard) - both very hardy - plus 'Elsie Lee' produces double-flowering offspring
- 'Haru-no-Sono' (Satsuki) - a tetraploid with multiple flower patterns
- 'Maruschka' (Hachmann) - very dark red flowers and foliage, with leaves that are exceptionally shiny

Making a Cross

Just prior to the unfurling of the flowers, Joe brings the selected parent plants into the garage for the crossing process. This enclosed space offers protections from the elements, like rain and wind which can interfere with the procedure. It also minimizes the risk of having insects bring in foreign pollen. Since Joe is rarely home before dark, he needs the light in the garage to perform this intricate task.

In making a cross, Joe first removes the unopened petals and the anthers from the seed parent to prevent self-pollination. He then applies the ripe pollen to the sticky, receptive stigma of another azalea that shows promise. By repeating these steps using the same two parents, he can maximize the possibility that fertilization will take place and seed will be produced. After pollination, Joe segregates all the pollinated azaleas in one area of the yard to facilitate seed collection.

Seed Collection and Growing

Joe usually gathers the seed pods in October when the pods are almost ripe. This must be accomplished before a hard freeze that would cause the pods to open and disperse their contents, leaving nothing but useless shells. He places the pods from each female azalea in a separate, labeled, small manila envelope, and these are kept in a warm place where the pods will continue to dry. Joe harvests the seed as soon as the end of a pod starts to split. He dumps the ripened

▲ At left is an example of a seedling transplated into a 2" pot. At right plants are shown in an in-ground cold frame.

▲ Parents of 'Rebecca Taffet'. At left is 'Elsie Lee' and at right is 'Satellite'.

▼ 'Rebecca Taffet'

pods from that plant into a tea strainer with fine holes and, using a needle-nose plier, opens the capsules. Shaking the strainer allows the seeds to drop through while the chaff remains inside the strainer. The debris is disposed of as it can become a source of fungal contamination if introduced into the planting medium.

After gathering the tiny azalea seeds together, Joe places them in a labeled glassine[1] bag, and then tightly seals it to prevent the seeds from escaping (plastic bags are not used as they allow moisture retention that encourages fungal growth). As soon as is practical, Joe sows the seed, but first he prepares a medium of 100% milled sphagnum moss far enough in advance to allow it to become evenly moist. He places this material in 6-cell packs to a depth of about 1-½", and then gently firms and smooths the surface. Joe sprinkles the seed thinly over the top of the medium, with no additional sphagnum on top, and then settles the seed in using a fine water mist from a spray bottle.

In each cell pack, Joe places a label to indicate the parents and the year of the cross. Eight of these cell packs are placed in a tray fitted with a clear plastic, 4" tall domed lid to maintain a high humidity environment. He then places the trays on a shelf under cool-white fluorescent lights, positioned about 8" above the soil level, and timed to be on for 16 hours per day. The ambient temperature remains fairly constant in the mid-70s. A temperature in this range is ideal, as cooler temperatures will cause delay in germination, and warmer conditions will tend to dry out the medium too quickly.

Germination usually takes place within three weeks, and Joe removes the domed lid soon after. Subsequently, frequent observation is necessary to make certain the new plants are never allowed to become dehydrated. Joe waters only when the surface looks dry, wanting to keep the moisture more concentrated at the bottom of the soil to encourage downward root growth. By lifting each tray, Joe is able to assess its weight to determine if more water is needed.

Seedlings grow rapidly, and by December are in need of thinning. Joe transfers some of these seedlings to additional cell packs, two per cell, in a medium of 50% peat moss and 50% Perlite, placing seedlings that are especially vigorous in a 2" square pot to give them additional space. In the transplant process, Joe uses a tweezer, holding each seedling only by its leaves as grasping the stem can cause damage that would result in the plant's demise.

If there is extra seed when Joe has finished this part of the process, he returns it to its manila envelope and places multiple envelopes inside a re-sealable plastic bag. Excess air is removed from the bag before placing it in the refrigerator to prevent moisture retention. Although Joe much prefers to use fresh seed, unused seed, stored like this, can last for several years.

Up-Potting

By late April, as soon as the weather starts to warm, the seedlings are ready to be transplanted into their own 4" square pot in a medium of 50% peat moss and 50% Perlite. This activity takes place in the garage to keep the tender plants from exposure to the cold. Joe places the trays of potted transplants at the front of the garage where, on pleasant days, the main door is opened to give them as much indirect sunlight as possible. As soon as the danger of a spring frost has passed, he moves these plants to an in-

▲ Parents of 'Antoinette Martin'. At left is 'Festive' and at right is 'Satellite'.

▲ Parents of MV-04-39. At upper left is 'Maruscka', bottom left is 'Florence Waldman' and at right is 'Festive'.

▼ 'Antoinette Martin'

▼ MV-04-39 to be auctioned at 2016 convention.

ground cold frame, out of direct sun; they stay there until they are ready to be up-potted the following spring.

At that time, Joe up-pots the new plants into a 3-quart pots and moves them into an area along the back fence where high shade is available. During the third season, he gives all the young azaleas that are in serious contention a home in one of the test beds.

Labeling

The importance of durable labeling cannot be overstated. If a label goes missing, the plant is of little value to a hybridizer. For this reason Joe has chosen metal tags. He makes the tags from rolls of metal sheeting and, using a tool and die set, stamps it with his breeder number. This number consists of a letter or number from each of the two parents' names, the last two numbers of the year the cross was made, and the unique seedling number. For instance, 'Mary Lou Dority' has been assigned BK-00-14. The B is for 'Betty Christopher', the K for 'Komo Kulshan', the 00 for the year 2000, and the 14 because it was the 14th seedling from the cross.

Segments of the sheeting are then cut into strips and one end is punched with a small hole. Plastic covered telephone wire is threaded through the hole and the label is secured around the base of the seedling. These metal tags have passed the test of time, proving to be almost indestructible.

Care and Feeding

Consistent with his goal of wanting to grow low maintenance azalea forms, Joe provides his plants with little more than the basics: water, sunlight, and an acidic, organically enriched, porous soil. Pinching, fertilizing, winter protection and pest control are performed only as needed.

In order to establish a well-branched form, Joe starts pinching seedlings at a very young age and continues this practice until they are ready to be planted in one of the test beds. After that he leaves them on their own to allow them to demonstrate their inherent plant habit.

Joe has found that it is best to fertilize with restraint. Occasionally he will provide small seedlings with a ¼-strength acid type product, applied at every other watering. For these and slightly older azaleas he has found liquid Schultz® All Purpose 10-15-10 Plant Food™ to be the most satisfactory. For larger plants Miracle-Gro® Organic Choice® All Purpose Plant Food™ has proved helpful.

▲ 'Ryleigh Paige'

▲ 'Beautiful Beth'

▲ 'Mary Jane Cummings'

▲ 'Barbara Tozzi'

▼ 'Mary Lou Dority'

▼ 'Zoe Elizabeth Stoltz'

Disease, Insect, and Animal Pest Control

Unfortunately, fungi enjoy the same environment as azalea seedlings. One of the reasons that Joe uses sphagnum moss is that it is resistant to fungal growth. However, if bits of pod are inadvertently introduced into the medium when the seeds are planted, they can act as inoculators, creating little islands of disease. Through frequent observation, one can determine if fungi are present, some looking like gray hairs. When he observes this condition, Joe sprays the plants with a fungicide appropriate for seed rots and damping off diseases (e.g., Captan™ or Funginex®).

During the seedling stage gnats can appear out of nowhere. By hanging fly catcher strips on the seedbed shelves, Joe has been able to control these pests.

Some animals have been destructive to his azaleas. Squirrels enjoy digging in a pot's soft soil, and mice like to feed on young plants. By adding hardware cloth to both the bottom and the top of the cold frames, Joe has been able to thwart the intentions of these rodents for those azaleas that are of transplant size.

As with so many of us who grow azaleas, deer are a major problem. There is nothing more frustrating to a hybridizer than to discover one morning that all the buds for that year have been devoured. Joe has found Liquid Fence™ to be helpful.

Winter Protection

Although the cold frames are sunk into the ground and in a position protected by fencing and hedges, sometimes this is not enough protection for the azaleas during their first winter outside. If temperatures are expected to be below 10°F, a layer of row crop cover is secured over the frames to help mitigate rapid changes and/or extremes in temperature. Joe chooses row cover, rather than plastic, because this lightweight, non-woven fabric allows moisture to penetrate to the plants, permits good air exchange, and prevents unwanted increases in the cold frame temperature should the weather warm significantly.

The pots of second year seedlings are clustered together and mulch is banked around the perimeter of the group before winter cold sets in. All azaleas in the test bed are given only a layer of leaf mulch for protection.

Plant Evaluation and Data Collection

To date Joe has made 275 crosses resulting in more than 12,000 seedlings. Of this huge group, Joe has selected only 22 for naming and introduction, a testament to the rigor with which every plant is judged. All are assessed at every step in their growth, noting each one's special attributes. Every numbered selection must prove itself to have superior characteristics for it to retain a position in the garden. Joe gives the best forms additional space in the test beds to allow them to develop their inherent growth habit. This selection process can take ten years or more.

Foliage is the main focus of evaluation during the seedlings' second season; those that have unusual shapes, size, or glossy dark green color are segregated for additional scrutiny. Plant habit is assessed throughout each year, and features like legginess, and susceptibility to disease and insect damage are duly noted. After each winter, plants are inspected for damage from the cold, and throughout the summer, each is appraised for heat tolerance and the effects of the sun.

Spring is an exciting time for hybridizers. Bob Stewart notes that "Unless you are a hybridizer and spend countless hours growing and evaluating seedlings, you cannot know the sensation of seeing a seedling bloom for the first time." Joe would heartily agree with this statement, admitting to feeling like a kid in a toy store as he searches with anticipation through his young seedlings during their coming-out party. The most remarkable of these are photographed and the images stored on the computer as part of his documentation system.

In order to assess ease of rooting, Joe asexually propagates the most promising of his azaleas. Those that do not grow well from cuttings are deemed unsuitable for further evaluation. Several clones of each cultivar that can be propagated reliably are placed in multiple test beds to determine their performance in various microclimates and soil conditions. This practice also helps ensure against the loss of a single cultivar from unforeseen circumstances, like a falling limb.

In addition to his own evaluation, Joe enjoys hearing comments from family, friends, and fellow azaleaphiles who visit the garden. During his selection process, their input is given substantial consideration.

Surprises versus Expectations

Life is full of surprises, and hybridizing is no exception. When Joe crossed CL-95-81, which has a double variegated flower, with 'James Stewart', a bicolor, he expected some great variegated doubles. No exceptional offspring of this nature were produced, but, to his surprise, an excellent semi-double form emerged with flowers in shades of moderate to dark pink with a light throat and a small dark red blotch This fabulous find was christened 'Bob Stewart' in 2013.

'Elsie Lee'×'Satellite' also produced some unexpected results. Although the former is a reddish-purple semi-double, and the latter a bright pink and white variegated semi-double to double, 'Rebecca Taffet ' is a white double with up to 16 petals and very ruffled edges. The surprise here is that white is the lowest on the color dominance list, so not to be anticipated in a cross of colorful parents. 'Ryleigh Paige ' is a recent introduction that came out of the same cross. It is also a very full double, but the color is solid bright pink.

Other nice surprises include 2M-00-15, a cross of 'Ashley Ruth'×'Martha Hitchcock', which has fantastic fall leaf color. The foliage display almost equals the impact of a spectacular azalea in full bloom. J1-99-02 resulted in flowers with a 360 degree blotch; one that encompasses all the petals, rather than just the upper lobes. Although he does not consider the above worthy of introduction, they may well be used in future crosses to see if their special characteristics can be brought forward in progeny that fulfill Joe's objectives.

'Antoinette Martin' came out of 'Festive'×'Satellite'.

Both have variegated flowers and, as anticipated, some of the offspring were also variegated. But one seedling in particular could knock your socks off; the colors are so vibrant, and the patterns so pronounced that it makes a stunning statement. I think this one could actually be considered both an expectation and a surprise.

'Mary Jane Cummings' is another remarkable variegated form, having very bold shades of purple with varying amounts of white. Her parents were the white 'Brenda Marie' and a seedling from 'Festive'×'Satellite'.

These are but a few examples of the magic that takes place in the Klimavicz garden.

Naming and Registration

Initially, Joe named his selections for family members. Once that was accomplished, he was disinclined to spend the time searching for interesting and available names for others that were ready for introduction. His wife, Brenda, came up with the neatest of solutions: allow a charitable organization to auction off the naming rights. Not only did the plant acquire a meaningful name, but a worthy cause was well supported.

Joe has been kind enough to donate the naming rights for one of his azaleas to the 2016 ARS/ASA Convention. The lucky winner of MV-04-39 will acquire several copies of the azalea as well as a certificate of registration.

Joe registers all his named hybrids with the Royal Horticultural Society (RHS), the International Cultivar Registration Authority (ICRA) for the genus *Rhododendron*. Detailed descriptions of his introductions can be found in various issues of the *Journal of the American Rhododendron Society.*

Challenges

When asked what his greatest challenges have been, Joe's instant response was "time and space." Working long hours and frequent travel in his professional life leave little time at home. As a result, daylight hours for the garden and hybridizing are few and far between. To compensate, Joe often performs tasks in the garage, or uses a headlamp to work in the garden after dark.

Joe and Brenda Klimavicz live in suburban Vienna, Northern Virginia on a lot of only 1/3 acre. To maximize space, most of the seedlings, once they reach three years of age, are planted close together on their 170-foot-long backyard hillside test bed. Not only does this provide good drainage, but it also affords Joe an excellent viewpoint from which to quickly take note of any outstanding features. For those visiting the garden in late April to mid-May, it offers a breathtaking sight. There are also smaller test beds located throughout the yard. At any one time, several thousand azaleas are under evaluation.

New Goals

Joe has added several new goals to the original set. He currently is breeding for a double true red, wanting one with no blue or orange tints. This is a challenging combination to achieve, as red is fairly low on the dominance list and doubles can be difficult to attain.

Variegated flowers are of particular interest to Joe. He would like to find one that has flowers with impressively different and distinct color zones that also have heavier than average texture.

He is also experimenting with a way to produce that ever-elusive yellow evergreen azalea. To that end he is planning to cross an early blooming yellow deciduous with a later flowering evergreen. Pollen from the former will be saved inside gelatin capsules and stored in the freezer until the seed parent is receptive.

Rhododendron occidentale

Some of Joe's hybrids have exhibited some pretty spectacular fall foliage color. In the future, he would like to find an azalea that combines this feature with exceptional flowers.

His most recent objective is to create a double flowering yellow deciduous azalea.

About Joe

Joe Klimavicz has been gifted with seemingly boundless energy, a high curiosity quotient, and a superb memory. These talents are well-suited to the task of hybridizing, and Joe has bundled them together in a package that allows him to accomplish much more than one might envision possible.

Joe has a very generous nature. He is more than willing to share the vast amount of experiential knowledge he has accumulated over the years. Each season he offers cuttings of his named hybrids, as well as excess seed, to those who are interested. He frequently opens his garden to visitors, an opportunity not to be missed.

In the words of Bob Stewart, "Joe is an exceptional guy; a perfectionist, a great husband, and a wonderful dad."

During his tenure as president of the Northern Virginia Chapter of the ASA, Joe chaired the 1998 National ASA Convention. He has spoken at other conventions, and to several chapters within of the ASA, about his hybridization project.

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Learn More

If you would like to learn more about Joe and his hybrids, you can go to the Northern Virginia Chapter website at http://www.nv-asa.org, click on 'Legacy Project' on the left menu, and then on the 'Klimavicz' tab.

The Klimavicz hybrids will be among those featured at the 2016 Convention plant sale. This event will be located in Williamsburg, Virginia and hosted by the Northern Virginia Chapter of the ASA and the Potomac Valley, Mason-Dixon, and Middle Atlantic Chapters of the ARS. Information on the convention can be accessed at http://www.arsasaconvention2016.org.

Conclusion

Joe Klimavicz has produced many exceptional azalea hybrids, and continues to search for more treasures that have that magical quality that entices us to add them into our gardens. Bob Stewart's expressed wish for Joe is that "he finds what he's looking for; it's out there."

References

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Hyatt, Don, "Hybridizing Fever–The Quest for New Azaleas", ***The Azalean***, 1997. 19 (4): 69-72.

Hyatt, Don, "The Furman Rhododendron Legacy: A Labor of Love", *Journal of the American Rhododendron Society*, Fall 2015. 69 (4): 208-215.

Notes

1. Glassine is a thin, smooth and glossy, usually transparent paper that is air-, water-, and grease-resistant, also used by philatelists.

Carolyn Beck *is a retired Registered Nurse and an active member of the Northern Virginia Chapter. She and her husband, Paul, are concentrating their efforts on the chapter's Legacy Hybrids (see NV-ASA.org for more information on their Legacy Project). She is also the NV-ASA 2016 Convention plant sale chairman. The chapter is working on growing 2000 azaleas for the sale. Carolyn is one of the contributors and plans to provide about 1000 in a combination of 4"- and 3-quart pots.*

New Members

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