Developing New Crapemyrtle Cultivars

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Crapemyrtle, Lagerstroemia indica, is a large flowering shrub or small tree native to China yet is well adapted to Oklahoma and the southern half of the United States, approx. USA hardiness zone 7 or 6b and southward. It is especially tolerant to heat and drought and flowers on new growth once temperatures reach a sustained day temperature of roughly 85+°F with long days. Once flowering is triggered to begin, on many cultivars flowering continues for 100 to 120 days or more.

After I left Oklahoma State University in 1985 to pursue other goals, I made a list of problems and challenges that needed additional attention and research. I then set out to work on those problems on my own. One of those challenges identified was to try to develop a crapemyrtle with good qualities and true red flowers. In the fall of 1985 I collected seed from an unusual old crapemyrtle plant in downtown Stillwater, Ok. that I had admired for years. No one knew for sure, but the specimen was most likely a seedling that had come from the breeding and seedling selection work of Mr. Otto Spring of Okmulgee, Ok. In the spring of 1986 I planted the seed and began to select seedlings with desired traits from the population. In the first generation, approx. 96% of the seedlings were loaded with powdery mildew. However, by saving seed from those with the least powdery mildew, by the third generation of seedlings the proportion displaying disease susceptibility had dropped to about 60% and, many of the seedlings were resistant even under the most severe conditions in early fall. With the third and subsequent generations it became common to find a plant that was white with powdery mildew adjacent in the row and with intertwining branches with a plant showing no symptoms. It was clear that a high degree of powdery mildew resistance could be obtained in pure Lagerstroemia indica seedlings. This was of particular interest in that the flower colors of L.indica seedlings are typically much more vivid and dramatic vs. the more muted flower colors of Lagerstroemia fauriei seedlings. Further, the hybrids between the two species, developed by Donald Egolf at the USA National Arboretum, all displayed the muted flower colors.

The fourth generation and some 26,000 seedlings later exposed a gene exposed for wine foliage. In subsequent generations this would range from wine new growth that changed to various shades of green by the time leaves reached full size to leaves that began as wine then slowly changed to a very dark wine/green over the growing season. Unfortunately, early seedlings with wine foliage were more susceptible to powdery mildew and would turn white under humid conditions. In the fifth generation several seedlings were obtained that had both wine foliage and a good level of mildew resistance. One of those is Pink Velour®, ‘Whit III’ cultivar, with shrill pink flowers. Also, in the fifth generation flower fragrance was detected in several seedlings from one parent. While walking rows of seedlings in the field a distinct rose-like fragrance would be noticed. Raspberry Sundae® “Whit I’ cultivar was selected for its flower fragrance, near columnar growth, bronzy new foliage and striking raspberry red/white variegated flowers and excellent orange / red fall color.

The sixth generation was the first expression of a gene for true red flowers (not purple-red). Seedlings from several parents had flowers that approached red, but seed from one particular seedling parent produced three with true red flowers. The most striking of these is Dynamite® ‘Whit II’ cultivar. Dynamite was nearly seven feet tall by July of the third growing season when it flowered for the first time. It was so distinct that I noted in my record book that this is Dynamite and the name stuck. Dynamite® is a vigorous tree form that may reach 20 to 25 feet in zones 8, 9 and 10. The flowers are bright cherry red and continue for roughly 120 days.

In the continuing selection of seedlings with desirable characteristics over multiple generations, substantial changes can occur. For example, in July 1999, approx. 8400 seedlings from generations 8 and 9 were planted in the field for further evaluation. Only about 5% showed susceptibility to powdery mildew vs. 96% in the first generation.

About 25 to 45% of the seedlings from most parents will flower during the first year. This gives the opportunity to select for possible parent plants for future seedlings and turn generations quite quickly relative to other woody plants. However, the remaining 55 to 75% of the crapemyrtle seedlings may require 2 to as many as 6 years to flower. For example, a large block of 6 th generation seedlings from one parent were not particularly impressive. Cuttings were taken from only 9 seedlings for further evaluation and only two were deemed worthy of planting into a master block. After 4 years, I decided to destroy these 6th generation seedlings, except that when I got to one very compact dwarf I moved it back to a stock area just to see if it would ever flower. It did flower after the fifth growing season and with good red flowers plus it turned out to be 100% sterile. This is now Tightwad Red® 'Whit V' cultivar. Tightwad Red® plants 3 years old and never pruned are 24 inches tall and equally as wide with the rounded growth habit of a fall garden mum or dwarf yaupon holly. The moral is that I now keep seedling blocks at least 6 years.

By the end of the growing season with the 6th generation (1992), I had assembled 132 seedlings with desirable traits into a master block. In the spring of 1993 I took 30 softwood cuttings from each of the 9 most desirable seedlings. After rooting they were placed in one-gallon containers and allowed to grow until mid July. At that time 20 plants of each were planted into the field and watered by hand once. Five days after planting 0.7 inches if rain fell, but with no measurable precipitation for the next 34 days. Survival of two selections were 20 of 20 and one was 18 of 20, 3 were 5 of 20, while one selection survived only 1 of 20 and with two selections, all died. Clearly it is possible to select for drought and landscape establishment toughness. Interestingly, the correlation of landscape establishment toughness with the capacity to root quickly in propagation and grow well in one-gallon containers was poor. It was clear from this study that more is involved in rapid landscape establishment under stressful conditions than just the capacity for rapid root development in containers as all 270 plants of the 9 seedling selections were about the same size and were similarly rooted when they were planted into the field. The three seedlings with outstanding toughness are now known as Raspberry Sundae®, Dynamite® and Pink Velour®, respectively. Tightwad Red® and Red Rocket® had not yet been selected and were not part of the study, however, they have since been put through similar stress tests and have performed well.

Another aspect of this work involves the selection of parents from which to collect seed. I have observed that to be a good parent the plant must have desirable features such as resistance to powdery mildew. However, beyond the obvious, some of the most productive parents in terms of providing new and varying features among their seedlings were themselves not particularly outstanding. I have saved seeds from parents with thick, leathery leaves and interesting flowers only to have the offspring's all be runts with poor root systems. Have the three seedlings that displayed exceptional drought tolerance in the study produced seedlings with exceptional drought tolerance? No. Each year I save seed from 30 to 50 seedlings that have, for some reason, caught my interest and generally from the one or two most recent generations. In the 1999 plantings, there was one parent from the 1996 seed block that yielded seedlings that were more vigorous and with superior root development compared to all others. This parent produced seed for the first time in 1998 and will be watched closely as well as its offspring.

Also, in the 1998 planting, seedlings from one parent exhibited exceptional tolerance for frost in the fall. Both in the fall of 1998 and 1999, there were 6 seedlings that retained their full complement of leaves after 3 frosts of

about 30°F, which defoliated all of the other seedlings as well as the older plants. Whether this translates into some slight improvement in other aspects of cold hardiness remains to be seen.

Including the 1999 population, roughly 160,000 seedlings have been grown in the field for evaluation since the project began in the spring of 1986. Many more were culled while still in the seed flats or at transplanting if the root development was poor and yet others were culled while in small containers awaiting planting into the field. Presently approx. 35 acres are devoted to the screening and selecting of superior crapemyrtle seedlings. Screening multiple generations of seedlings for plants with superior qualities requires years of dedication, considerable outlay of time and expenses and a lot of space.

From 1986 through 1998 and roughly 150,000 seedlings that were decedents from the original parent plant, only two had white flowers. However among the seedlings from one plant from the 1996 seedling block over 30 plants with white flowers resulted. Work in this area will continue until a cultivar with wine foliage and white flowers and other good qualities is found.

Another aspect of the importance of seed parent selection was noted in the 10,000 seedlings from 52 parents planted in the field in July 2000. Seeds from one parent had produced only 53 seedlings, yet 48 had intense wine foliage. When revisiting the parent, it was mildew free and had good foliage and red flowers, but it did not have wine foliage, Seed collected from another parent yielded only 12 seedlings but one is an extremely compact but upright growing dwarf with miniature leaves and flowers pinkish - lavender in color. How will it propagate and perform in containers and the landscape? Only time and additional study will tell.

From this research to date, there have also been seedlings with orange flowers, near blue flowers and white flowers with yellow pedicels. None of these have had other qualities that made them worthy of further evaluation. For example, the plant with distinct orange flowers was from a 5th generation parent. The orange flowers are striking but the plant flowers only once during a growing season for a 2 to 3 week period and does not rebloom. To date seed has been saved each year from the parent of the orange flowered seedling, but no further seedlings with orange flowers have occurred. A few of the seed collected from the orange flowered seedling finally germinated in the spring of 1999 but as yet none have flowered. The one seedling that produced near blue flowers is a gangly unattractive plant that gets mildew. The seedling with white flowers that are yellow at the base produced viable seed in 1999. I have hopes of eventually creating cultivars with orange, blue and yellow flowers. To get good quality plants with these new flower colors may take 2 years, 5 years or even 10, but from my research to date these are attainable. While pursing these goals, who knows what additional genes may be exposed. The fun continues.

A variety of other woody plants and grasses are also being studied using this multigenerational selection process. Unfortunately, progress has been much slower because 6 to 10 years is typically required from the time of planting a seedling until it flowers and produces viable seeds to begin the next generation selection process.