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Three New Crape Myrtle (*Lagerstroemia*) Cultivars for Southern Landscape

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Crape myrtle (*Lagerstroemia*) is a genus in the *Lythraceae* (loosestrife family) that comprises ≈50 to 80 species (Cabrera 2004). The origins of crape myrtle vary, including the Indian subcontinent, Southeast Asia, central and southern China, Korea, Japan, and parts of Australia (Zhou et al. 2023). Their colorful flowers, attractive bark, and long blooming duration have led to their being widely cultivated in tropical and subtropical regions worldwide. Among all species, the most popular are *Lagerstroemia indica* L. and *Lagerstroemia indica* × *Lagerstroemia fauriei* Koehne hybrids (Pounders and Sakhanokho 2015) due to the various flower colors of *L. indica* and the disease resistance of *L. fauriei*. Crape myrtles were first introduced to the United States in the late 1700s (Egolf and Andrick 1978; Pooler 2006) and later became popular for landscape use in subtropical and tropical regions of the United States. Depending on their use in landscapes, crape myrtles have been categorized into three types based on plant height: semidwarf cultivars, intermediate cultivars, and tree-type cultivars. In the United States, the commercial production of crape myrtles relies mostly on asexual propagation, particularly the cloning of named cultivars (Byers 1997). This ensures consistency in characteristics such as flower color, size, and growth habits. Although modern crape myrtle cultivars often possess a genetic background from *L. fauriei*, their disease and pest resistance vary due to physical and chemical mutations as well as genetic recombination. Despite the US National Arboretum releasing many powdery mildew–resistant cultivars, the market and growers continue to seek new cultivars with novel traits, such as dark leaves, which may not have strong disease resistance. Although many dwarf cultivars are available today, most develop water sprouts a few years after establishment and revert to their normal growth habit. Our new cultivars, however, are easy to propagate and manage, have a long-lasting blooming period, exhibit various flower colors, maintain great dark green foliage throughout entire growing season, and a semidwarf, fountain-like habit.

Origin

Since 2012, the Woody Ornamental Laboratory at the University of Georgia (UGA) has embarked on a project to develop new crape myrtle cultivars. With objectives centered around extending the blooming period, diversifying flower and foliage hues, and enhancing disease resistance, numerous hybridization attempts were undertaken, leading to a wide selection of seedlings being planted for evaluation. The initial crosses were made in 2016 for all the three cultivars. By 2019, the most promising seedlings were selected for rigorous field trials at the Durham Horticulture Farm in Watkinsville, GA, and all the three cultivars were assigned accession numbers (C14-35 for 'Pristine Crystal', C14-39 for 'Pristine Lilac', and D03-29 for 'Pristine Ruby') for potential new cultivars and future breeding work. After a comprehensive 4-year assessment, three standout seedlings, notable for their clean foliage and flower colors, were selected as new cultivars. Remarkably, two of these seedlings (C14-35 and C14-39) emerged from a cross between PM-8 (a powdery mildew–resistant seedling of Delta Jazz®) and PM-58 (the gamma-ray irradiated seedling of Dazzle Me Pink® dwarf round leaf pink selection), showcasing the innovative use of physical mutation in plant breeding, whereas D03-29 resulted from a hybridization between cultivars Crescent Moon and Ebony Fire. 'Crescent Moon' is an intermediate-sized, round-shaped cultivar known for its excellent disease resistance and long blooming period, producing an abundance of attractive white flowers. 'Ebony Fire', on the other hand, is an intermediate-sized, upright-shaped cultivar characterized by its dark purple leaves and red flowers. These three cultivars were distinguished by their superior resistance to powdery mildew, maintaining vibrant, green foliage throughout the summer season. In recognition of their clean foliage year-round and captivating floral displays, these cultivars were named Pristine Crystal, Pristine Lilac, and Pristine Ruby. Each name reflects the unique aesthetic characteristics that these plants bring to landscapes and gardens, promising not only visual beauty but also improved health and longevity. This initiative underscores the laboratory's commitment to enhancing the diversity and resilience of crape myrtles, offering gardeners and landscapers new options for their green spaces.

Description

Habit. The three cultivars, characterized as semidwarf, fountain-like shrubs, have demonstrated remarkable growth over 4 years at the UGA Horticultural Farm. These cultivars, named Pristine Crystal, Pristine Lilac, and Pristine Ruby, have reached impressive heights of 2.8 m, 2.7 m, and 3.3 m, respectively. Their vertical growth is complemented by substantial horizontal expansion, with the north–south and east–west dimensions measuring 3.3 × 3.4 m for 'Pristine Crystal' (Fig. 1A), 3.2 × 3.1 m for 'Pristine Lilac' (Fig. 1B), and 3.9 × 3.7 m for 'Pristine Ruby' (Fig. 1C). These measurements underscore not only the robust nature of their growth but also the meticulous cultivation and selection process that has led to their development.

The dimensions of each cultivar reflect their unique genetic makeup. 'Pristine Crystal', with its slightly more compact form, demonstrates a balanced growth that could be advantageous for certain landscaping applications where space is a consideration. Meanwhile, 'Pristine Lilac', with its slightly smaller stature, still shows significant growth potential and may offer unique aesthetic qualities with its likely vibrant coloration, hinted at by its name. Their semidwarf, fountain-shaped structure makes them versatile, suitable for use in borders, hedges, and containers. 'Pristine Ruby' exhibiting the most substantial growth in both height and spread, suggesting a potentially superior adaptation to the local environment. This vigorous growth pattern is indicative of a strong root system and optimal nutrient uptake, likely a result of selective breeding practices aimed at enhancing these traits.

The potential impact of environmental factors on these growth patterns cannot be overstated. Soil composition, water availability, and microclimatic conditions at the UGA Horticultural Farm have undoubtedly played a role in shaping the growth characteristics of these cultivars. Continued observation and study of these factors will provide valuable insights into optimizing growth conditions for future cultivars. These findings highlight the interplay between genetics and environment in horticultural success and pave the way for further advancements in ornamental plant breeding. The growth of the three new cultivars was fast during the first 3 years after being planted in the field. By 2022, 2023, and 2024, the size of the three cultivars had stabilized with little change. This fast growth habit

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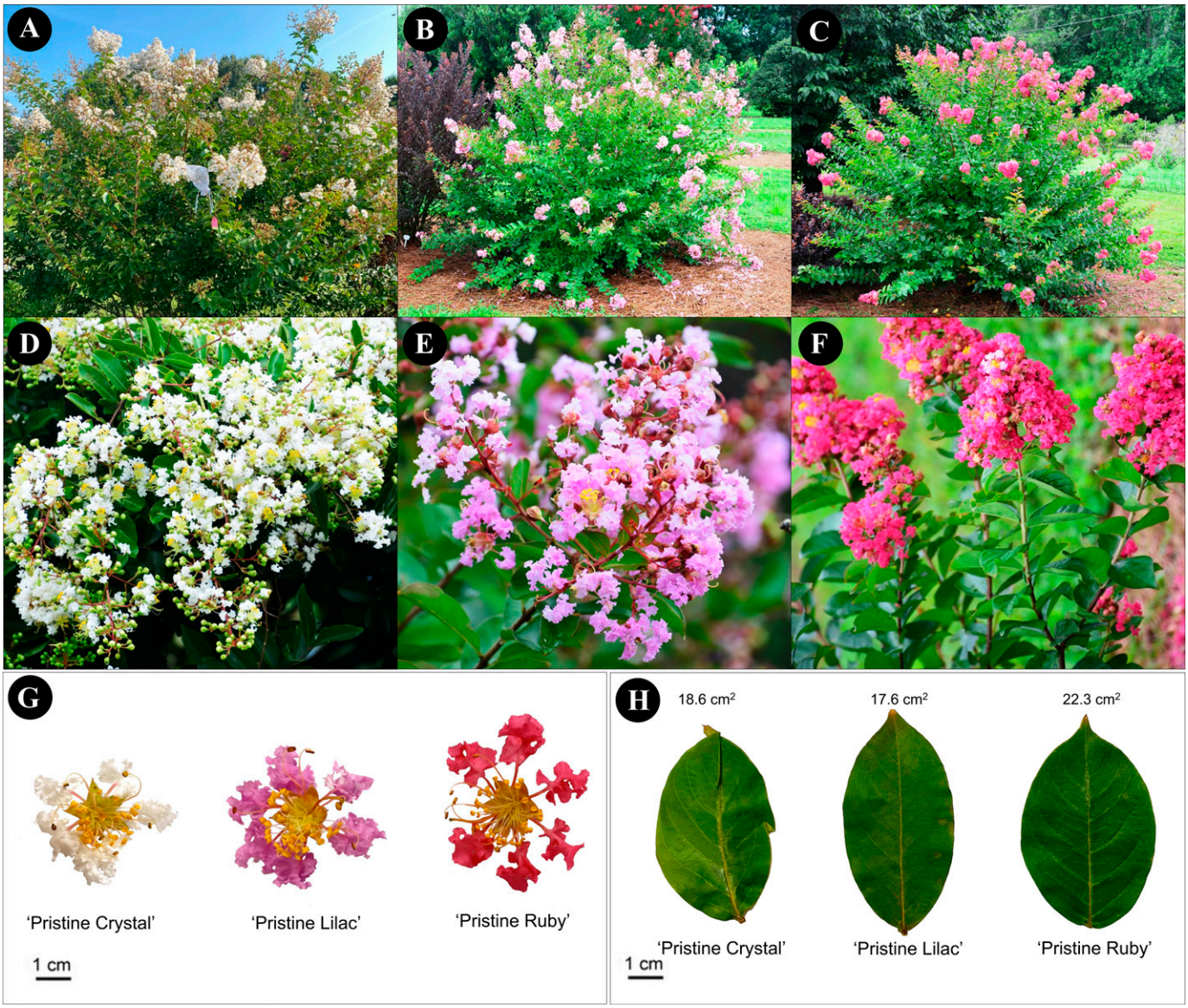

Fig. 1. Habit, blossom, and foliage of the three new cultivars. (**A**) Growth habit of 'Pristine Crystal'. (**B**) Growth habit of 'Pristine Lilac'. (**C**) Growth habit of 'Pristine Ruby'. (**D**) Panicles of 'Pristine Crystal'. (**E**) Panicles of 'Pristine Lilac'. (**F**) Panicles of 'Pristine Ruby'. (**G**) Flower characters of the three cultivars. (**H**) Leaf characters of the three cultivars.

is advantageous for new homeowners looking to establish their yards quickly.

Foliage. Beginning in late March to early April, all three cultivars initiate leafing, each showcasing uniquely attractive young foliage. 'Pristine Crystal' features young leaves of a grayish brown color (RHS 166A, Table1), which mature into a moderate olive-green shade (RHS 137A, Table 1), providing a subtle yet elegant foliage display. Meanwhile, 'Pristine Lilac' stands out with its vibrant strong yellow-green young leaves (RHS 144A, Table 1) that evolve into a grayish olive green as they mature, creating a bold and eye-catching contrast in any garden setting. 'Pristine Ruby' presents young leaves with a striking brown hue (RHS 172A, Table 1) that transitions to a moderate olive green (RHS 146A, Table 1) upon maturity, offering a dynamic visual change throughout the growing season.

The foliage of these new cultivars measures 5 to 7 cm in length and 2.5 to 4 cm in width, all characterized by an entire leaf margin and an apiculate tip, adding to their refined appearance. Notably, 'Pristine Ruby' boasts an ovate leaf shape, distinguishing it from the elliptical form seen in both 'Pristine Crystal' and 'Pristine Lilac' (Fig. 1H). This variation in leaf shape provides consumers with more choices and indicates the genetic diversity among crape myrtle cultivars achieved through breeding.

From spring through fall, the leaves of these cultivars remain remarkably clean, a stark contrast to other seedlings that often suffer from moderate to severe powdery mildew infections. We also have other cultivars on our farm for breeding work, including the Dazzle series and Ebony series. However, none of the existing cultivars surpass our new cultivars in terms of leaf cleanliness. This resistance to common foliar diseases significantly reduces the need for chemical treatments, making these cultivars more sustainable and environmentally friendly options for gardeners and landscapers. Additionally, all three cultivars feature very short petioles, ranging from 2 to 4 mm in length, which contribute to their compact and tidy growth habit, further emphasizing their distinctiveness and appeal as superior selections for cultivation and ornamental use.

These unique characteristics make 'Pristine Crystal', 'Pristine Lilac', and 'Pristine Ruby' highly desirable for a variety of landscape applications. Their robust growth, disease resistance, and visually appealing foliage ensure that they will be standout additions to any ornamental planting. Their introduction represents a significant advancement in horticultural breeding, providing gardeners with new options that combine beauty, resilience, and low maintenance. As these cultivars continue to be evaluated, their full potential in diverse environmental settings will be better understood, paving the way for their broader adoption and appreciation.

Table 1. Distinguished flower and foliage characteristics of the three new cultivars.

	Pristine Crystal	Pristine Lilac	Pristine Ruby
Flower color	RHS NN155D white	RHS 77C light purple/77C strong purple	RHS 58B/RHS 58C strong purplish red
Young leaf color	RHS 166A grayish brown	RHS 144A strong yellow green	RHS 172A strong brown
Matured leaf color	RHS 137A moderate olive green	RHS NN137 grayish olive green	RHS 146A moderate olive green
Flower diameter (cm)	3.14 ± 0.15	3.81 ± 0.23	3.65 ± 0.14
Sepal length (cm)	0.54 ± 0.07	0.53 ± 0.05	0.40 ± 0.07
Bud length (cm)	0.73 ± 0.05	0.92 ± 0.06	0.67 ± 0.07
Bud width (cm)	0.61 ± 0.06	0.74 ± 0.05	0.66 ± 0.07
Pedicel length (cm)	0.50 ± 0.08	0.58 ± 0.06	0.43 ± 0.07
Petiole length (cm)	0.12 ± 0.04	0.32 ± 0.06	0.17 ± 0.05
Leaf length (cm)	5.51 ± 0.49	6.59 ± 0.31	6.24 ± 0.39
Leaf width (cm)	3.16 ± 0.33	3.10 ± 0.25	4.19 ± 0.33
Panicle length (cm)	13.18 ± 1.48	16.23 ± 3.51	15.97 ± 0.86
Petal length (cm)	1.15 ± 0.10	1.64 ± 0.10	1.44 ± 0.07
Petal width (cm)	1.01 ± 0.07	1.10 ± 0.08	1.05 ± 0.05
Leaf out	Late March/early April	Late March/early April	Late March/early April
Bud out	Early June	Early June	Late May/early June

Flower. The three new cultivars, Pristine Crystal, Pristine Lilac, and Pristine Ruby, exhibit an extended blooming season from the end of May or early June through late August and early September, aligning perfectly with the climatic conditions of USDA Cold Hardiness Zone 8a (Table 1). This characteristic, coupled with their vibrant colors and disease resistance, positions them as exceptional choices for landscaping in the southern United States.

'Pristine Crystal' captivates with its pristine white blossoms (RHS NN155D, Table 1), slightly smaller in size, ranging from 2.9 to 3.4 cm in diameter, offering a clean and elegant aesthetic. Meanwhile, 'Pristine Lilac' enchants with its light purple flowers (RHS 77C, Table 1), with diameters spanning from 3.5 to 3.9 cm, adding a delicate touch of color to the landscape. 'Pristine Ruby' is distinguished by its striking strong purplish-red flowers (RHS 58C, Table 1), with individual blooms measuring between 3 and 4 cm in diameter, making a bold statement in any garden. Each flower across the cultivars is composed of six segments, featuring ruffled, claw-like petals, and distinctive style-like staminodes (Fig. 1G). The blooms are organized in terminal panicle arrangements, contributing significantly to their visual appeal and garden presence.

Remarkably, all three cultivars share a similar blooming timeline, initiating in early June and continuing through the end of August, with July marking the peak of their floral display. Reblooming may occur with deadheading. This synchronized blooming period, alongside their aesthetic attributes and robustness, underscores their potential to enhance southern landscapes with continuous and colorful blooms throughout the summer months.

The petal lengths of the three new cultivars, Pristine Crystal, Pristine Lilac, and Pristine Ruby, vary distinctly, measuring 1.0 to 1.3 cm, 1.5 to 1.8 cm, and 1.3 to 1.5 cm, respectively. Similarly, their sepals exhibit varying lengths: 0.4 to 0.6 cm for 'Pristine Crystal', 0.3 to 0.5 cm for 'Pristine Lilac', and 0.5 to 0.6 cm for 'Pristine Ruby'. Although the individual flowers and petals of these cultivars are relatively small compared with other species, they compensate with their impressive panicle size and density. The panicle lengths are particularly noteworthy, with 'Pristine Crystal' (Fig. 1D) measuring 11 to 15 cm, 'Pristine Lilac' (Fig. 1E) extending from 12 to 22 cm, and 'Pristine Ruby' (Fig. 1F) showcasing panicles of about 14 to 17 cm.

These dimensions not only highlight the unique characteristics of each cultivar but also suggest their potential for creating visually striking displays in gardens and landscapes. The extended blooming period and substantial aesthetic appeal of their panicles, despite the smaller size of individual floral components, make these cultivars highly desirable for enhancing outdoor spaces with vibrant, long-lasting floral arrangements. The robustness and disease resistance of 'Pristine Crystal', 'Pristine Lilac', and 'Pristine Ruby' further ensure their suitability for a wide range of landscaping applications, promising to bring continuous beauty and color to southern landscapes throughout the summer months.

Fruit. Fruits became visible 1 week after the flowers bloomed. The initial color of the fruits for all three cultivars was light green, which gradually darkened to a dark brown or black over time. The fruits were ready for harvest from late September to late October. When mature, the capsule-like fruits split open into six channels, dispersing seeds onto the ground. Each fruit could bear 30 to 50 seeds, although some seeds were defective and lacked an embryo. Despite the large number of seeds produced annually, no seedlings emerged around the three cultivars, making them easy to manage for landscape use.

Additional note. Despite Georgia occasionally experiencing severe winter weather conditions, these plants demonstrate remarkable resilience, easily overwintering due to their robust cold hardiness. However, the blooming period of the three cultivars—Pristine Crystal, Pristine Lilac, and Pristine Ruby—is significantly affected by late frosts. Such frosts can cause damage to new leaves and result in a delay of the blooming time by ∼2 to 3 weeks. This susceptibility highlights the importance of considering climatic challenges in their cultivation and underscores the need for protective measures or strategic planting to mitigate the impact of late frosts on these otherwise resilient and beautiful cultivars.

Propagation. Upon identifying promising cultivars, developing an efficient propagation method is crucial for their multiplication. For the three new cultivars, Pristine Crystal, Pristine Lilac, and Pristine Ruby, softwood cuttings collected on 31 May and 7 Jun 2023, and treated with Hormodin #1 (OHP, Inc., Mainland, PA, USA) have shown successful rooting. The rooting percentages for 'Pristine Crystal', 'Pristine Lilac', and 'Pristine Ruby' were 86.5%, 87.5%, and 80.2%, respectively. These cuttings were nurtured under a shadecloth equipped with an adequate misting system. The misting was programmed to activate for 10 s every 10 min over a period of 4 weeks. Once rooted, the cuttings were transplanted into 2.8 L pots complemented with 1 tsp/gal of slow-release fertilizer (14–4–14) to support optimal plant growth. Typically, cuttings reach a height of ∼1 m by the end of their first growing season and will start to bloom from late summer until the first frost. This propagation strategy underscores the balance between creating a conducive environment for root development and ensuring the young plants have the necessary nutrients to flourish and reach their blooming potential within their first year.

Availability

Information about the three new cultivars can be obtained from Dr. Donglin Zhang (e-mail: donglin@uga.edu). At the time of publication, three new cultivars are available for restricted test agreement only.

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