Developing Sterility in Genetically Dwarf *Lagerstroemia* Selections to Foster Perpetual Flowering

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Nature of Work: The development of sterility in dwarf *Lagerstroemia* selections from the Dirr breeding program at the University of Georgia has several potential advantages. Sterile selections may flower longer, increasing ornamental value. Concern about the ability of non-native plants to self-perpetuate in the landscape and out-compete native vegetation is an important issue for the horticulture industry. Research to develop sterile ornamentals will show the public that the industry is proactive in addressing invasiveness issues.

Results and Discussion: In fall 2004, open-pollinated seed were collected from a white-flowered dwarf *Lagerstroemia* selection from the Dirr breeding program (DWF-07-00) grown at the Center for Applied Nursery Research. The seed were divided into equal lots and were exposed to 0, 15, 20, 30, and 40 kr of gamma radiation. The radiation was done at the USDA facility in Tifton, Georgia through the support of Dr. Wayne Hanna, which we gratefully acknowledge.

Seed were sown under standard conditions in greenhouses in Athens, GA on January 19, 2005. Each treatment consisted of approximately 5600 seeds. Germination percentages were highest in the control and 15 kr treatments, 20.4% and 18.2% respectively. Both the 20 kr and 30 kr treatments had germination percentages of 12.9%. The 40 kr treatment had the lowest germination percentage at 10.7%.

Although germination was higher than expected in the radiated treatments, seedling vigor was greatly decreased by mutation induction. Seedlings continually died before and after transplanting. In the control, 54% of seedlings were transplanted and 53% survived to be potted. In the 15 kr treatment, 71% of the seedlings were transplanted but only 21% survived to be potted. In the 20 kr treatment, 18% of the seedlings were transplanted and only 4% survived to be potted. All of the seedlings in the 30 kr and 40 kr treatments died before ever being transplanted.

605 plants grown from open-pollinated seed, 217 plants grown from seed treated with 15 kr, and 29 plants from the 20 kr treatment are being grown at CANR. We are collecting data on length of time from seeding to first flower, date of first flower, flower color, plant height, plant width, winter hardiness, and seed production.

Although seedlings from open-pollinated *Lagerstroemia* are highly variable, it is unlikely that plants currently grown from irradiated seed are showing traits induced by the mutation process. For genetic reasons, we will need to grow out the second generation of these plants to see the expression of sterility or other useful traits. Therefore, we will gather seed from plants in our

irradiated population that show desirable traits and grow out plants for at least one more generation.

Significance to Industry: This breeding and genetic research is long-term. We anticipate finding the extent of variability created from irradiation in coming generations. In the short term, we have identified plants from these populations that have desirable characteristics, including a plant with attractive pink flowers that has been blooming for four months.