

Documentation on the Development of Ornamental Redbud (*Cercis canadensis*)
'NC2016-2'
(To be marketed as Flamethrower™)

Ornamental redbud NC2016-2 (*Cercis canadensis*) was derived from a controlled hybridization of NCSU breeding selection NC2006-14 (weeping, purple leaf) and commercial cultivar 'JN1' (non-weeping, gold leaf, trademarked as The Rising Sun™). The goal of the controlled hybridization was to develop a form of this popular ornamental tree that co-expressed both the purple leaf and gold leaf genes. The initial hybridization was made by hand in March 2010 in the home garden of Dennis Werner in Raleigh, NC using an established landscape tree of NC2006-14 as the female parent. Hybrid F₁ seed was harvested from NC2006-14 in September 2010. Seeds were acid scarified, and subsequently cool-stratified for about 6 weeks in fall 2010 to satisfy the seed chilling requirement. Seed were sown in January 2011 under greenhouse conditions, and 24 F₁ seedlings were ultimately recovered, and initially grown in containers in the greenhouse in spring and summer 2011.

Seedling F₁ trees subsequently were transferred to a field isolation block at the Sandhills Research Station in November 2011. All 24 F₁ trees showed green leaves and non-weeping architecture. F₂ seed was obtained in each of two ways. F₁ trees in the field isolation were intermated using natural pollinators, and 4 F₁ trees were dug from the field isolation planting in winter 2014, potted in large containers, and intermated by hand in the HFL greenhouse in March 2014. The first F₂ seed was obtained in September 2014. F₂ seed was acid scarified and cool stratified in fall 2014. After scarification and stratification treatments were completed, seed was sown and germinated in January 2015, and seedlings were grown in the greenhouse during summer 2015. Only seedlings showing putative coexpression of both the gold and purple leaf genes were desired, hence all green leaf seedlings were eliminated at the seedling stage. During summer 2015, 82 F₂ trees were selected, and budwood of nine of the best selections (based on greenhouse performance) was sent in August 2015 to Hidden Hollow Nursery in Belvidere, TN to initiate initial nursery trials. Eighty F₂ trees were subsequently established in a field planting on November 2015 at the Sandhills Research Station. During the summer of 2016, 18 seedlings were selected based on superior expression of both gold and purple leaf color, tree architecture, and resistance to leaf burn. Budwood of these 18 selections were sent to both Hidden Hollow Nursery and Jackson Nursery in Belvidere, TN in August 2016 for initial propagation and nursery trialing using chip budding on *Cercis canadensis* rootstock. Five trees of each selection were propagated. Based on evaluation of the initial seedling trees at the Sandhills Research Station for 3 years, and evaluation of performance in Belvidere, TN in 2016 and 2017, NC2016-2 ultimately was chosen as the superior selection, showing the best combination of gold and purple leaf color, resistance to leaf scorch, and excellent tree architecture.

NC2016-2 shows a slight pendant growth habit, but is classified as non-weeping (Figure 1). Leaves of NC2016-2 show a dynamic transition of color change from the

time of leaf emergence and throughout the growing season. Leaves emerge purple, and quickly turn to red as they expand. As an individual leaf matures, it transitions from purple, to red, to reddish-bronze, and ultimately yellow-green (Figures 2, 3, 4, 5, 6, and 7). Because all leaves are in different stages of development at any particular point in time, the tree displays a dynamic mix of colors, especially during stages of active growth. Maximal variable leaf color is expressed early to mid-season, and declines as summer temperatures increase after mid-July (Figure 2). Flowers of NC2016-2 are abundant, and typical of the species in color (light purple), size, and morphology (Figure 8).

NC2016-2 will be licensed to Star Roses and Plants (SRP), with whom I have a Sponsored Research Agreement. NC2016-2 has drawn considerable interest in the nursery trade, with several production nurseries licensed by SRP having already committed to producing the plant. NC2016-2 represents the first redbud available in the trade that demonstrates this unique expression of leaf color.



Figure 1. Two-year-old tree of NC2016-2 showing semi-pendant growth habit and variation in leaf color expression. Image taken June 26, 2017 at the Sandhills Research Station.



Figure 2. Newly emerged immature foliage of NC2016-2. Image taken April 17, 2017 at the Sandhills Research Station.



Figure 3. Foliage of NC2016-2 taken on May 26, 2017 at the Sandhills Research Station.



Figure 4. Foliage of NC2016-2 taken on June 26, 2017 at the Sandhills Research Station.



Figure 5. Foliage of NC2016-2 taken on July 10, 2017 at the Sandhills Research Station.



Figure 6. Foliage of NC2016-2 taken on August 10, 2017 at Hidden Hollow Nursery, Belvidere, TN.



Figure 7. Foliage of NC2016-2 taken on September 26, 2017 at the Sandhills Research Station.



Figure 8. Flower of NC2016-2.