

# 'Asian Moon' *Buddleja*

Scott E. Renfro<sup>1</sup>, Brent M. Burkett<sup>1</sup>, Bruce L. Dunn<sup>1</sup>,  
and Jon T. Lindstrom<sup>2,3</sup>

Department of Horticulture, University of Arkansas, 316 Plant Sciences  
Building, Fayetteville, AR 72701

*Additional index words.* Buddlejaceae, Scrophulariaceae, Loganiaceae, interspecific hybridization, chromosome counts, invasiveness

To address issues of invasiveness with some *Buddleja* L. species, a triploid *Buddleja* was released. *Buddleja* (Scrophulariaceae Juss., formally Buddlejaceae K. Wilhelm and Loganiaceae R. Brown), commonly called butterfly bush, is a recent addition to invasive plant lists in the United States but has been on invasive lists in other countries for a longer period of time (Crawley, 1987; Oregon Department of Agriculture, 2006; Staples et al., 2000). *Buddleja davidii* Franch., the most commonly used species in landscape plantings, is singled out on these lists because of its ability to grow in most environments, outcompete native plants, and to produce hundreds to thousands, and even millions, of seeds per year. The seeds that dehisce from capsules are small, lightweight, and typically winged, allowing them to disseminate freely. Reducing invasive potential of *Buddleja* will enable its continued use in the managed landscape. The hybrid 'Asian Moon' should be evaluated in areas where invasiveness of *Buddleja davidii* is a concern.

## Origin

As part of a larger crossing study between diploid species ( $2n = 2x = 38$ ) and tetraploid species ( $2n = 4x = 76$ ), controlled pollinations in the greenhouse were made on 10 May 2001 between the tetraploid *B. davidii* var. *nanhoensis* (Chitt.) Rehd. 'Moonshadow' (the female parent) and the diploid *B. asiatica* Lour. (the male parent) (Burkett, 2001). A similar cross *B. davidii* × *B. asiatica* named *B. ×hybrida* Fahrquar was reported by Rehder (1947) and later by Moore (1949) without indications of its fertility status. Numerous flowers were emasculated before anthesis using tweezers, and pollination occurred once a day for 3 d after emasculation. Capsules were collected as they matured and began to dehisce. Seeds were sown on 17 Aug. 2001 in pots using a 1:1 ratio of Fafard #2 (Portland, OR) mix and perlite that had been autoclaved and pretreated with boiling water. Pots were placed in a Park Seed

Biodome (Greenwood, SC) until the seeds germinated. Only one viable seedling was obtained from this cross, which was planted in the field at the University of Arkansas Research Farm, Fayetteville, in 2002. The single progeny was evaluated on morphological measurements, including corolla length and width, and calyx length (Table 1) along with flower color and fruit/seed production. This progeny has been tested as *Buddleja* 01-27-588. The name proposed for this selection is 'Asian Moon' because it resulted from a cross between *B. davidii* var. *nanhoensis* 'Moonshadow' and *B. asiatica*.

## Description

*Buddleja* 'Asian Moon' has a symmetrical, round, shrub-like growth habit (Fig. 1). After 5 years of growth, the original plant has obtained a height of 2.2 m with a spread of 2.7 m. Mature leaves of 'Asian Moon' are lanceolate to elliptic in shape with an acuminate leaf tip and an acute leaf base. Leaf margins are serrate. The adaxial surface of the leaf was dark green in color (RHS 137A), whereas the abaxial surface was gray-green (RHS 194C). Color was assessed by observation using the Royal Horticultural Society (RHS) Color Charts (Royal Horticultural Society, 1966).

Flowering on 'Asian Moon' began in late May or early June and the flowers were borne on numerous panicles found at the tips of the new growth. Flower color was light purple (RHS 88D), but color did vary depending on ambient temperature; cooler weather resulted in darker flowers (Fig. 2). After flowering, only vestigial fruit, with no viable seed, were produced by this plant (Fig. 3).

Although many of the morphological characteristics of the single F1 plant resemble the female parent, *B. davidii* var. *nanhoensis* 'Moonshadow', there are several features that allow separation of the two plants. The leaves of 'Moonshadow' are linear to elliptic in shape, shorter, and narrower than the leaves of 'Asian Moon'. The upper leaf color is a darker green (RHS 139A) compared with

'Asian Moon' (RHS 137A). Flower color on 'Moonshadow' (RHS 88A) was slightly darker than 'Asian Moon' (RHS 88D). However, flower color of 'Moonshadow' also varies as a result of ambient temperature. Finally, comparison of capsule development as well as chromosome counts can be used to separate the two closely related butterfly bush cultivars.

To confirm that this selection was a triploid, chromosome counts were made according to the protocol outlined by McClintock (1929). Chromosome root-tip counts indicated that the progeny from the cross was indeed triploid (Renfro, 2004) (Fig. 4).

## Adaptability

Propagules of 'Asian Moon' had been grown successfully in Arkansas (Fayetteville, Little Rock, and Hope) and Pennsylvania (Kennett Square). It appears to have reliable cold hardiness from U.S. Dept. of Agriculture Zone 6b to USDA Zone 8. 'Asian Moon' tolerated dry soils as it was evaluated in a nonirrigated plot in Fayetteville, but grew best on moist, well-drained sites. This selection grows best in full sun conditions, a general characteristic of *Buddleja*. Under optimal conditions, it should be expected to grow 1 m (3.3 ft) a year.

## Performance

This particular plant has shown outstanding and consistent blooming qualities wherever it has been grown. Its whitish purple color is equivalent to that of commercially available cultivars. This cultivar could be used as a substitute in areas where *B. davidii* is considered invasive as a result of the production of vestigial capsules lacking viable seed. It has the typical elongated panicle with multiple flowers common among *B. davidii* var. *nanhoensis*. However, inflorescences are smaller in size than those produced on *B. davidii* cultivars.

## Culture

Propagation of this cultivar can be achieved with a high rate of success from softwood cuttings taken in the spring or summer, dipped in 1000 ppm K-IBA, and placed under intermittent mist in perlite or other similar medium. Rooting usually takes less than 2 weeks.

## Availability

'Asian Moon' is being distributed to nurseries. A list of commercial sources or rooted stem cuttings can be obtained by

Table 1. Flower measurements in millimeters of parents and single F1 progeny.<sup>2</sup>

Species	Corolla length	Corolla width	Calyx
<i>Buddleja davidii</i> var. <i>nanhoensis</i> 'Moonshadow'	11.57 ± 0.35	8.80 ± 0.46	3.07 ± 0.26
<i>Buddleja asiatica</i>	5.55 ± 0.21	6.21 ± 0.39	4.05 ± 0.33
F1 progeny	9.10 ± 0.30	8.47 ± 0.32	3.76 ± 0.32

<sup>2</sup>For each, 10 flowers were measured; the mean ± standard deviation is shown.

Received for publication 5 Feb. 2007. Accepted for publication 3 May 2007.

<sup>1</sup>Graduate students.

<sup>2</sup>Associate professor.

<sup>3</sup>To whom reprint requests should be addressed; e-mail tranell@uark.edu.



Fig. 1. Original plant of *Buddleja* 01-27-588.



Fig. 2. An inflorescence from 'Asian Moon'.

contacting Dr. Jon Lindstrom, Department of Horticulture, University of Arkansas, Fayetteville.

#### Literature Cited

- Burkett, B.M. 2001. Hybridization, production, and identification of *Buddleja davidii* (butterfly bush) and interspecific *Buddleja* hybrids, University of Arkansas, Fayetteville. MS Thesis.
- Crawley, M.J. 1987. What makes a community invasible? p. 429–453. In: Gray, A.J., M.J. Crawley, and P.J. Edwards (eds.). Colonization, succession and stability. Blackwell Scientific Publ., Oxford, UK.
- McClintock, B. 1929. A method for making acetocarmine smears permanent. *Stain Technol.* 2:53–56.
- Moore, R.J. 1949. Cytotaxonomic studies in the Loganiaceae. III. Artificial hybrids in the genus *Buddleja* L. *Amer. J. Bot.* 36:511–516.

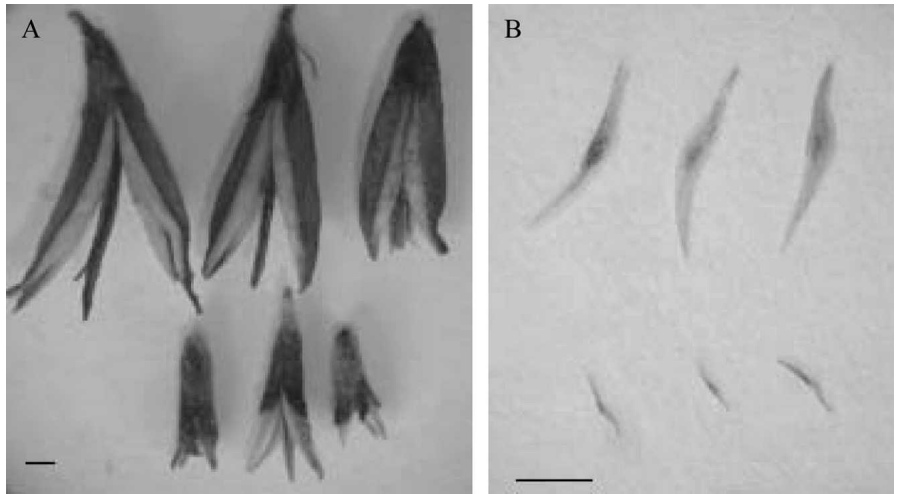


Fig. 3. (A) Capsule comparison between typical *Buddleja davidii* v. *nanhoensis* 'Moonshadow' capsules (top row) and vestigial capsules (bottom row) from 'Asian Moon'. (B) Seed comparison showing *Buddleja davidii* v. *nanhoensis* 'Moonshadow' viable seed and 'Asian Moon' vestigial seed. Bars = 1 mm.

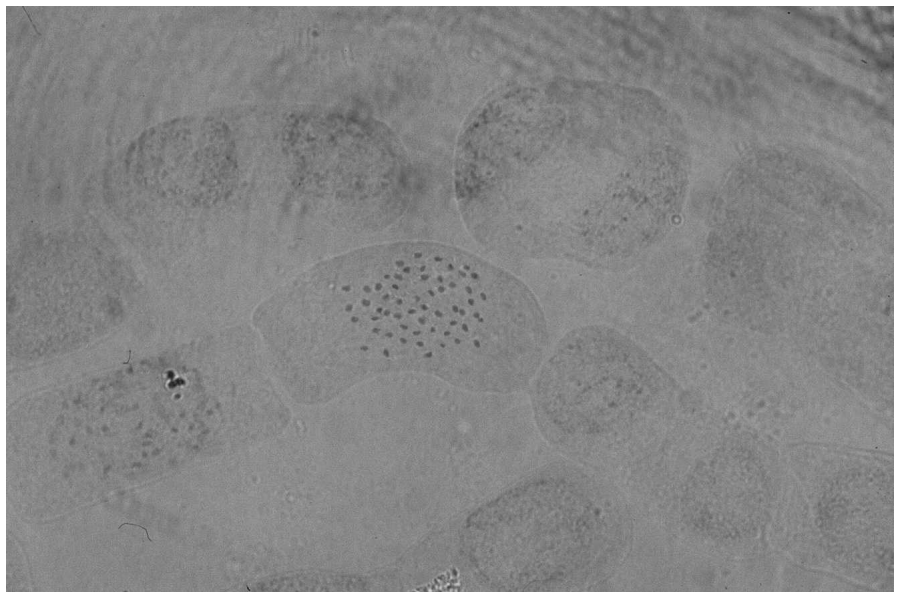


Fig. 4. Chromosome count of 57 indicating hybrid nature as expected from crossing a tetraploid with a diploid species. Picture taken with a Nikon microscope (Nikon, Melville, NY) with a Nikon N2000 front-mount camera using  $\times 1000$  magnification.

- Oregon Department of Agriculture. 2006. Oregon noxious weed control policy and classification system 2006. 12 Jan. 2007. <[http://egov.oregon.gov/ODA/PLANT/WEEDS/docs/weed\\_policy.pdf](http://egov.oregon.gov/ODA/PLANT/WEEDS/docs/weed_policy.pdf)>.
- Rehder, A. 1947. *Manual of cultivated trees and shrubs*. 2nd ed. Macmillan, New York.
- Renfro, S. 2004. Artificial hybridization: Intersectional and interspecific breeding among Asiatic

- and Neotropical *Buddleja* species, Univ. of Arkansas, Fayetteville, MS Thesis.
- Royal Horticultural Society. 1966. *Royal Horticultural Society Colour Chart*. Royal Hort. Soc., London.
- Staples, G.W., D. Herbst, and C.T. Imada. 2000. Survey of invasive or potentially invasive cultivated plants in Hawaii. *Bishop Museum Occasional Papers No. 65:31*.