'Purple Haze', 'Miss Molly', and 'Ice Chip' *Buddleja*

Dennis J. Werner^{1,3} and Layne K. Snelling²

Department of Horticultural Science, Box 7609, North Carolina State University, Raleigh, NC 27695-7609

Additional index words. *Buddlejaceae*, *Scrophulariaceae*, *Loganiaceae*, interspecific hybridization, plant architecture, invasiveness

Buddleja L. (Scrophulariaceae Juss., formally *Buddlejaceae* K. Wilhelm and *Loganiaceae* R. Brown), commonly called butterfly bush, is a popular landscape shrub worldwide valued for its summer flowering, fragrance, and attractiveness to butterflies. The majority of cultivars are *B. davidii*, and a range of flower colors are available. Most cultivars are vigorous, often attaining a height of over 2 m in one growing season, too large for many residential landscapes. Some species of *Buddleja*, including *B. davidii*, are regarded as invasive and are banned from commerce in some regions. To address the concerns of excessive vigor and invasive potential, two compact and sterile cultivars of *Buddleja* named 'Purple Haze' and 'Ice Chip' were released.

Pink is a popular color in *Buddleja*, but few pink-flowered cultivars are available. 'Pink Delight', the most common cultivar, is very vigorous, limiting its landscape uses. 'Miss Ruby', demonstrating improved pink color and compact growth habit as compared with 'Pink Delight', was released in 2009 (Werner and Snelling, 2009). 'Miss Molly' has been released to provide a cultivar with compact growth and darker pink flower color as compared with 'Miss Ruby'. 'Miss Molly' is moderately female-fertile.

Origin

'Purple Haze'. 'Purple Haze' resulted from controlled hybridization of 'Miss Ruby' × NC2003-4 (Fig. 1) made in 2004. 'Miss Ruby' resulted from controlled hybridization of 'White Ball' × 'Attraction'. 'White Ball', released by the Boskoop Agricultural Research Station, Boskoop, The Netherlands, is a compact, white-flowered cultivar of unknown parentage (Gert Fortgens, personal communication). 'Attraction', showing deep-purple flower color, was derived from open-pollination of 'Honeycomb' (Dirr, personal communication). NC2003-4 was derived from open

pollination of a family obtained from the controlled hybridization of 'Honeycomb' × NC2000-1. 'Honeycomb' is a yellow-flowered cultivar of *Buddleja xweyeriana* Weyer (Dirr, 2009). NC2000-1 is an interspecific hybrid derived from a controlled cross of *B. davidii* var. *nanhoensis* (Chitt.) Rehd. 'Nanho Purple' and *B. lindleyana* Fort. ex Lindl. (Elliott et al., 2004). 'Purple Haze' was selected in 2005 in field trials at the Sandhills Research Station, Jackson Springs, NC. It was subsequently tested in replicated field trials and grower locations under the test number NC2005-29. 'Purple Haze' was released by North Carolina State University (NCSU) in 2010.

'Miss Molly'. 'Miss Molly' resulted from controlled hybridization of 'Attraction' × 'Miss Ruby' made in 2004. 'Miss Molly' was selected in field trials in 2005 at the Sandhills Research Station, Jackson Springs, NC. It was subsequently tested in replicated field trials and grower locations under the test number

NC2005-8. 'Miss Molly' was released by NCSU in 2010.

'Ice Chip'. 'Ice Chip' resulted from controlled hybridization of 'Blue Chip' × NC2002-12 (Fig. 2). 'Blue Chip' is a complex interspecific hybrid (Werner and Snelling, 2009). NC2002-12 was derived from a controlled cross of 'White Ball' × 'Nanho Purple'. 'Ice Chip' was selected in field trials in 2006 at the Sandhills Research Station, Jackson Springs, NC. It was subsequently tested in replicated field trials and grower locations under the test number NC2006-10. 'Ice Chip' was released by NCSU in 2011.

Description

'Purple Haze'. 'Purple Haze' has a compact, mounding-spreading habit (Fig. 3). In replicated trials, unpruned 'Purple Haze' averaged 78.5 cm in height and 119.8 cm in width (height/width ratio = 0.66) after two growing seasons (Table 1). Mature leaves are elliptic, averaging 10.4 cm long and 2.6 cm wide. Foliage is green (RHS 137B) on the adaxial side and grayed green (RHS 194D) on the abaxial side (Royal Horticultural Society and Flower Council of Holland, 2007). Plants are very dense, a consequence of abundant lateral branching. Stems are semipendulous. Leaves are tardily deciduous, often retained until mid-December in USDA hardiness zone 7b.

Flowering begins in early to mid-June in Raleigh, NC, and continues throughout the growing season until interrupted by the first fall freeze event. Inflorescences are pendulous, and average 19.6 cm in length, with an

Fig. 1. Pedigree of 'Purple Haze'.

Fig. 2. Pedigree of 'Ice Chip'.

Received for publication 21 June 2011. Accepted for publication 13 July 2011.

We gratefully acknowledge the technical assistance of Chris D. Harlow, William M. Reece, Jr., Anna L. Sauls, and the staff of the Sandhills Research Station, Jackson Springs, NC.

¹Raulston Distinguished Professor.

²Research Technician (retired).

³To whom reprint requests should be addressed; e-mail dennis_werner@ncsu.edu.

average of 85 flowers per inflorescence. Individual flowers average 15 mm length and 5.4 mm width at the apex, typical of its *B. lindleyana* parent and considerably larger than those of typical *B. davidii*. Color of open flower petals is purple–violet (RHS N82A; Fig. 4). Color of the corolla tube inside surface is purple with orange undertones. Flowers are fragrant. Anthers are normal and produce abundant pollen.

‘Purple Haze’ is female-sterile. Five years of field observation of ‘Purple Haze’ in mixed

plantings with numerous pollenizer cultivars has revealed no evidence of fruit and seed production. In 2009, 10 entire panicles from each of three plants of ‘Purple Haze’ and control cultivars Pink Delight and Potter’s Purple were harvested at the end of the growing season from a mixed planting containing numerous advanced selections and eight fertile control cultivars. After harvest, inflorescences were dried at room temperature for 5 d, and each entire inflorescence (less any leaves and the main rachis of the panicle) was

crushed gently. Seed and inflorescence residue from each plant were sown on soilless media, left uncovered, and then placed under intermittent mist to maintain optimal moisture. Germination counts were recorded 5 weeks after sowing. Number of seedlings recovered per panicle averaged 0.9, 5.4, 2,910, and 10,100 for ‘Purple Haze’, ‘Blue Chip’, ‘Pink Delight’, and ‘Potter’s Purple’, respectively. The study was repeated in Fall 2010, and the number of seedlings recovered per panicle was 0.02, 992, and 1262 for ‘Purple Haze’, ‘Pink Delight’, and ‘Potter’s Purple’, respectively.

‘Miss Molly’. ‘Miss Molly’ has a semiupright, globose habit (Fig. 5). In replicated trials, unpruned ‘Miss Molly’ averaged 132.3 cm in height and 112.9 cm in width (height/width ratio = 1.18) after two growing seasons (Table 1). Mature leaves are elliptic, averaging 6.7 cm long and 1.8 cm wide. Foliage is green (RHS 137A) on the adaxial side and grayed green (RHS 194B) on the abaxial side. Plants are very dense with abundant lateral branching. Leaves are deciduous.

Flowering begins in mid-May in Raleigh, NC, and continues throughout the growing season. Inflorescences average 10.6 cm in length and produce up to 160 flowers per inflorescence. Unopened flower buds are red–purple (RHS 60A) and open to red–purple (RHS 61B, Fig. 6). Color of the corolla tube inside surface is yellow–orange (RHS 25A). In comparison, unopened flower buds and open flowers of ‘Pink Delight’, the existing standard pink cultivar in the trade, are purple (RHS 75A) and purple (RHS 75B), respectively. Unopened flower buds and open flowers of ‘Miss Ruby’ are red–purple (RHS 71A) and red–purple (RHS 71B to 71C), respectively, lighter than those of ‘Miss Molly’. Flowers are fragrant. Over multiple years in a field setting surrounded by fertile cultivars, ‘Miss Molly’ produced moderate amounts of seed. Anthers are normal and abundant pollen is produced.

‘Ice Chip’. ‘Ice Chip’ has a compact, spreading growth habit (Fig. 7). In replicated trials, unpruned ‘Ice Chip’ averaged 48.4 cm in height and 125.8 cm in width (height/width ratio = 0.36) after two growing seasons (Table 1). The unique spreading habit of ‘Ice Chip’ makes it appropriate for use as a groundcover. Mature leaves are elliptic, averaging 7.4 cm long and 2.7 cm wide. Foliage is green (RHS 137B) on the adaxial side and grayed green (RHS 194D) on the abaxial side. Plants are very dense with abundant lateral branching. Leaves are deciduous.

Flowering begins in mid-May in Raleigh, NC, and continues throughout the growing season. Inflorescences average 8.1 cm in length and produce up to 130 flowers per inflorescence. Unopened flower buds are white (RHS NN155C) and open to white (NN155B, Fig. 5). Color of the corolla tube inside surface is grayed yellow (RHS 162A). Flowers are fragrant. Anthers are malformed or lacking, and no viable pollen is produced. ‘Ice Chip’ is highly female-sterile. Five years of field observation of ‘Ice Chip’ in mixed plantings with numerous pollenizer cultivars has revealed no

Fig. 3. Two-year-old plant of ‘Purple Haze’ showing profuse flowering, compact habit, pendulous inflorescences, and spreading architecture.

Table 1. Plant height, width, and height/width ratio of *Buddleja* ‘Purple Haze’, ‘Miss Molly’, ‘Ice Chip’, and control cultivars after two growing seasons in Jackson Springs, NC.^z

Cultivar	Ht (cm)	Width (cm)	Height/width ratio
Purple Haze	78.5	119.8	0.66
Miss Molly	132.3	112.9	1.18
Ice Chip	48.4	125.8	0.36
Blue Chip	79.8	126.3	0.64
Miss Ruby	106.3	117.4	0.91
Black Knight	162.2	128.8	1.37
Ellen’s Blue	171.1	117.4	1.46
Lochinch	162.0	118.4	1.37
Nanho Purple	108.4	123.9	0.88
Pink Delight	167.9	125.8	1.34
Potter’s Purple	193.7	136.4	1.43
Royal Red	181.4	133.4	1.37
White Ball	79.7	100.6	0.79
Least significant difference (0.05 level)	11.5	12.5	0.11

^zPlants were not pruned between growing seasons. Values shown represent the mean of two replications with five plants per replication.

Fig. 4. Inflorescence of ‘Purple Haze’.

Fig. 5. One-year-old plant of 'Miss Molly' showing deep pink flower color and dense growth.

Fig. 6. Inflorescence of 'Miss Molly'.

Fig. 7. Two-year-old plant of 'Ice Chip'.

evidence of fruit and seed production. Using the same technique to assess female fertility as described for 'Purple Haze', 'Ice Chip' produced an average of 0.83 and 0.04 seedlings per panicle in 2009 and 2010, respectively.

Adaptability

Propagules of 'Purple Haze', 'Miss Molly', and 'Ice Chip' have been grown in North

Carolina (Raleigh and Jackson Springs, USDA hardiness zone 7b) and Michigan (Grand Haven, USDA hardiness zone 5). All have demonstrated reliable cold-hardiness for two winters in the Michigan trial and five winters in both North Carolina test sites. In the Michigan trial, plants of all cultivars died back to the ground and resumed growth from the crown the next spring. In North Carolina, aboveground shoots survived over

winter; hence, plants may require occasional moderate pruning to maintain the desired compact growth. Cultural requirements of 'Purple Haze', 'Miss Molly', and 'Ice Chip' are similar to other cultivars of *Buddleja*, most critically full sun exposure and well-drained soil.

Performance

'Purple Haze'. 'Purple Haze' has shown outstanding flowering performance in all trials. Because of its compact growth habit and pendulous panicles, 'Purple Haze' is appropriate for use in the front of mixed plantings or for mass plantings. Similar to most *Buddleja*, it attracts butterflies in abundance.

'Miss Molly'. 'Miss Molly' has shown outstanding flowering performance in all trials. The dense growth habit of 'Miss Molly' makes it appropriate as both a specimen plant and for use in mixed plantings. Its deep pink flower color is unique among existing cultivars of *Buddleja*. It attracts butterflies in abundance.

'Ice Chip'. 'Ice Chip' has shown outstanding flowering performance in all trials. Because of its compact and spreading growth habit, 'Ice Chip' is appropriate for use in the front of mixed plantings and as a groundcover in mass plantings. Similar to most *Buddleja*, it attracts butterflies in abundance.

Propagation

Propagation of 'Purple Haze', 'Miss Molly', and 'Ice Chip' can be achieved successfully by using softwood cuttings taken any time in the growing season, treating with low to moderate rates of indole-3-butyric acid, and placing under intermittent mist. Rooting usually occurs within 2 weeks.

Availability

U.S. plant patent applications have been submitted for all three cultivars. Plant patent rights will be assigned to NCSU. Plants and propagation rights can be obtained from Spring Meadow Nursery, Grand Haven, MI. Vouchers of all three cultivars will be deposited in the NCSU Herbarium (NCSC).

Literature Cited

- Dirr, M.A. 2009. Manual of woody landscape plants: Their identification, ornamental characteristics, culture, propagation, and uses. 6th Ed. Stipes Publishing, Champaign, IL.
- Elliott, W., D.J. Werner, and P.R. Fantz. 2004. A hybrid of *Buddleja davidii* var. *nanhoensis* 'Nanho Purple' and *B. lindleyana*. HortScience 39:1581–1583.
- Royal Horticultural Society and Flower Council of Holland. 2007. RHS Colour Chart. 5th Ed. RHS, London, UK.
- Werner, D.J. and L.K. Snelling. 2009. 'Blue Chip' and 'Miss Ruby' *Buddleja*. HortScience 44: 841–842.