

## **Summary of Characteristics**

### ***Buddleja* NC2006-10 (proposed to be released as 'Ice Chip')**

#### **Introduction**

*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, a compact and sterile cultivar of *Buddleja* named 'Ice Chip' is proposed for release.

#### **NC2006-6 - Origin and Characteristics**

*Buddleja* NC2006-10 was derived from a summer 2005 hybridization of 'Blue Chip' (NCSU cultivar tested as NC2004-9, USPP 19,991) x NC2002-12. 'Blue Chip' is a complex hybrid containing 3 different species and one botanical variety of *Buddleja* (*B. davidii*, *B. davidii* var. *nanhoensis*, *B. lindleyana*, and *B. globosa*). NC2002-12, the other parent of 'Ice Chip', is a hybrid of 'White Ball' x 'Nanho Purple'. 'Nanho Purple' is a cultivar derived from *Buddleja davidii* var. *nanhoensis*. 'White Ball' is described as a complex hybrid by its developer (Gert Fortens, personal communication), presumably containing *B. davidii* and *B. fallowiana*. The pedigree of NC2006-10 is shown in Table 1. All hybridizations shown in the pedigree were performed in the author's breeding program. Seeds were germinated in January 2006 and 343 progeny were grown out in summer 2006 at the Sandhills Research Station, Jackson Springs, NC. One seedling, designated NC2006-10, demonstrated extremely compact growth, a unique spreading architecture, and white flower color (Figure 2). In 2007 through 2010, NC2006-10 was tested in a replicated trial at the Sandhills Research Station at Jackson Springs, NC. In this trial,

unpruned plants of 'Ice Chip' attained a height and spread of 48.4 and 125.8 cm, respectively (height/width ratio = 0.36), after two years of growth (year 2008, Table 1). Plants were moderately pruned after year 2008, and thereafter left unpruned. Similar differences in vigor and growth habit were revealed in plants at the end of the third growing season in year 2009 (Table 2). NC2006-10 is judged as extremely dwarf and spreading compared to standard cultivars, and more compact than 'Blue Chip', the current dwarf standard in the trade. Compared to 'White Ball', the standard compact white flowered butterfly bush in the trade, NC2006-10 is reduced in height, is more spreading, and has a lower height/width ratio (Tables 1 and 2). The low height/width ratio of NC2006-10 makes it appropriate for use as a ground cover, a novel landscape usage for butterfly bush. Foliage is very dense and full. The attractive flower color ((RHS NN155C, unopened flower bud), and RHS NN155B, (open petal)), dwarfism, male and female sterility (see below), and unique spreading growth habit of NC2006-10 are the primary reasons for release. The inflorescences are typical of *Buddleja*, and individual flowers are very fragrant. Foliage of NC2006-10 is deciduous.

### **NC2006-10 Sterility**

NC2006-10 is highly female sterile. Five years of field observation of NC2006-10 in mixed plantings with numerous pollinizer cultivars at the Sandhills Research Station have revealed no evidence of fruit and seed production. In 2009, ten entire panicles from each of three plants of NC2006-10 and check cultivars 'Blue Chip', '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 known fertile check cultivars. After harvest, inflorescences were dried at room temperature for five days, 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 for germination. Germination counts were recorded five weeks after sowing. Number of seedlings recovered per panicle averaged 0.83, 5.4, 2910, and 10,100 for NC2006-10, 'Blue Chip', 'Pink Delight', and 'Potter's Purple', respectively. The study was repeated in fall 2010 (excluding 'Blue Chip'), and the number of seedlings recovered per panicle was 0.04, 992,

and 1262 for NC2006-10, 'Pink Delight', and 'Potter's Purple', respectively. Based on this high degree of female sterility, NC2006-10 was submitted to the Oregon Department of Agriculture (ODA) for consideration for production, marketing, and landscape use in the state of Oregon. Oregon currently bans all uses of butterfly bush because of its demonstrated invasiveness in the state. NC2006-10 was recently approved by the ODA for production, marketing, and landscape use in Oregon, making NC2006-10 one of the few cultivars (along with NCSU cultivars 'Purple Haze' and 'Blue Chip') available to growers and consumers in Oregon. NC2006-10 is also male sterile; anthers are malformed or lacking, and no viable pollen is produced.

### **Adaptability**

Plants of '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 following spring. In North Carolina, above ground shoots survived over winter, hence plants may require occasional moderate pruning to maintain the desired compact growth. Cultural requirements of 'Ice Chip' are similar to other cultivars of *Buddleja*, most critically full sun exposure and well drained soil. The short stature, unique spreading growth habit, prolific flowering, and female sterility of NC2006-6 are highly desirable traits that will allow this selection to be used in a wide range of landscape situations.

### **Propagation**

Propagation of '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 (IBA), and placing under intermittent mist. Rooting usually occurs within 2 weeks.

### **Intellectual Property Protection**

A U.S. plant patent applications have been submitted for 'Ice Chip'. Plant patent rights will be assigned to NCSU. Propagation and marketing rights will be assigned to Spring Meadow Nursery, Grand Haven, MI.

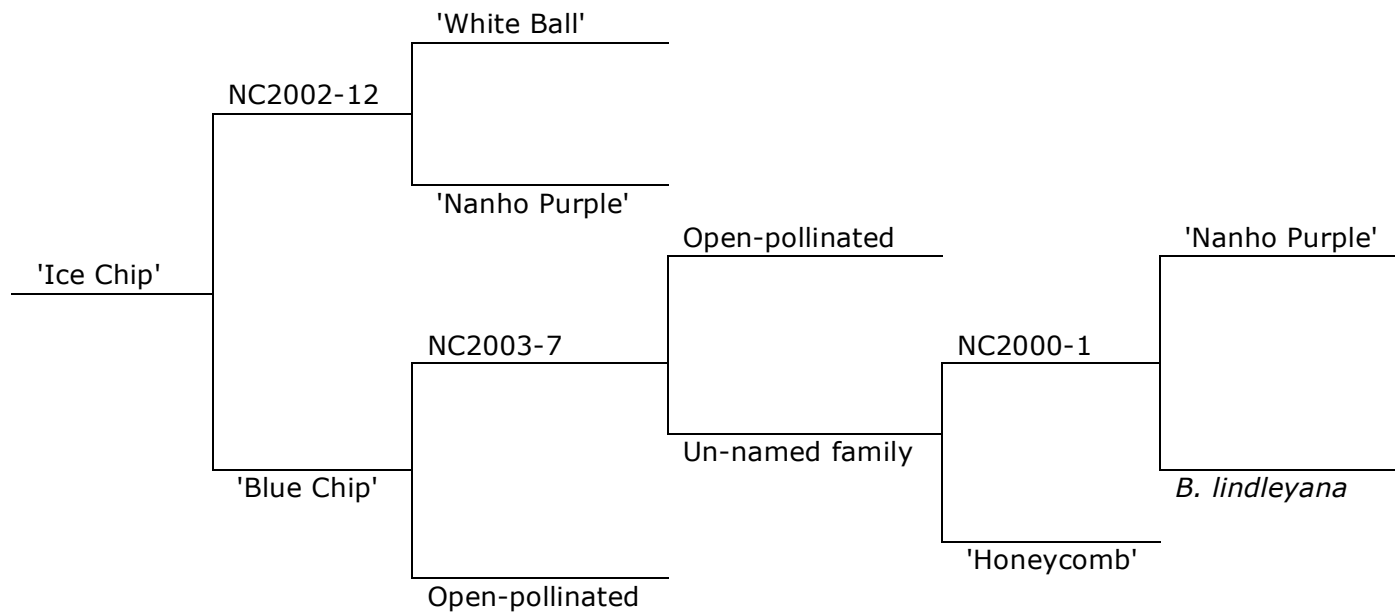


Figure 1. Pedigree of *Buddleja* 'Ice Chip'.

Table 1. Plant height, width, and height/width ratio of *Buddleja* 'Ice Chip' and check cultivars after 2 growing seasons (year 2008) in Jackson Springs, NC<sup>z</sup>. Plants were not pruned between growing seasons one and two.

Cultivar	Height (cm)	Width (cm)	H/W ratio
NC2006-6 ( <i>'Lilac Chip'</i> )	40.5	74.6	0.54
NC2006-10 ( <i>'Ice Chip'</i> )	48.4	125.8	0.36
Miss Molly	132.3	112.9	1.18
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
LSD (0.05 level)	11.5	12.5	0.11

<sup>z</sup>Values shown represent the mean of 2 replications with 5 plants per replication.

Table 2. Plant height, width, and height/width ratio of *Buddleja* 'Ice Chip' and check cultivars after 3 growing seasons (year 2009) in Jackson Springs, NC<sup>z</sup>. Plants were pruned after growing season two by removing about 50% of existing growth during the dormant season.

Cultivar	Height (cm)	Width (cm)	H/W ratio
NC2006-6 (Lilac Chip)	35.9	70.2	0.51
NC2006-10 (Ice Chip)	59.0	146.5	0.40
Miss Molly	159.2	191.2	0.83
Blue Chip	82.6	138.6	0.60
Miss Ruby	115.2	147.5	0.78
Black Knight	192.2	241.4	0.80
Ellen's Blue	174.9	217.0	0.81
Lochinch	173.9	217.6	0.80
Nanho Purple	119.5	183.3	0.66
Pink Delight	189.5	227.4	0.83
Potter's Purple	233.9	284.6	0.83
Royal Red	226.0	271.7	0.83
White Ball	123.3	115.9	1.06
LSD (0.05 level)	15.2	16.4	0.13

<sup>z</sup>Values shown represent the mean of 2 replications with 5 plants per replication.



Figure 2. Compact stature and spreading growth habit of *Buddleja* 'Ice Chip'. Two-year-old plant shown.