

Back from the ban

New *Buddleja* cultivars prove it can make sense to legalize sterile versions of some invasives



'Blue Chip' Lo & Behold® was found to have a 98.55 percent reduction in seed production compared to the mean of four other industry-standard cultivars. The reduced fertility of 'Blue Chip' comes from its complex pedigree, which is a common result of interspecific hybridization.

PHOTO COURTESY OF PROVEN WINNERS

By Ryan Contreras and Gary McAninch

Love it or hate it, the butterfly bush (*Buddleja davidii*) is familiar to nearly every gardener. It can be grown in USDA Zones 5–9 and is prized for its large panicles of fragrant flowers that attract butterflies in great numbers.

It's a tough plant that is so easy to grow it will make even those with a black thumb feel like a professional. Unfortunately, the same traits that make good nursery and landscape plants can lead to plants escaping cultivation to naturalize. Such has been the case with butterfly bush.

Buddleja is extremely floriferous, and these flowers then lead to prolific seed production. The seeds of butterfly bush have the ability to germinate in poor, inhospitable conditions where other plants struggle.

Butterfly bush is a pioneering species. This means that in disturbed areas, such as rights of way, it is often the first to colonize an area. Due to its vigorous growth, it can often out-compete native species. It is found in riparian areas of western Oregon as well as natural and commercial forests (Fig. 1).

Because of its tendency to spread, the Oregon State Weed Board (OSWB) designated butterfly bush as a "B List" noxious weed. This designation is for weeds of economic importance that are regionally abundant, but which may have limited distribution in some counties. Referring to the distribution map (Fig. 1), it is apparent that there are a number of eastern counties in Oregon that are not affected by butterfly bush, thus its "B" designation.

Designated as a "B List" noxious weed, butterfly bush was quarantined. The Noxious Weed Quarantine was established under administrative rule (OAR 603-052-1200), which prohibits import, transport, propagation or sale of select "A" and "B" listed noxious weeds.

At that point, it looked like the end of butterfly bush on nurseries in Oregon.

But I saw it for sale!

But as Mike Darcy pointed out in his "What I'm Hearing" column of a recent *Digger* issue (April 2013), butterfly

bush is actually alive and well on Oregon nurseries. How can this be possible?

The simple answer is that breeders have done great work in developing selections with greatly reduced fertility. The Oregon Department of Agriculture (ODA) recognized that such forms do not represent an ecological threat, and therefore should not be regulated.

It's easy to understand why ornamental plant breeders have worked so diligently to develop non-invasive *Buddleja* selections: simple economics. According to the Census of Agriculture conducted by the U.S. Department of Agriculture (USDA) in 2009, *Buddleja* had a national wholesale value of about \$30.5 million. Obviously, this is a substantial amount of revenue that was lost when the ban was enacted.

Growers noticed. The loss of but-

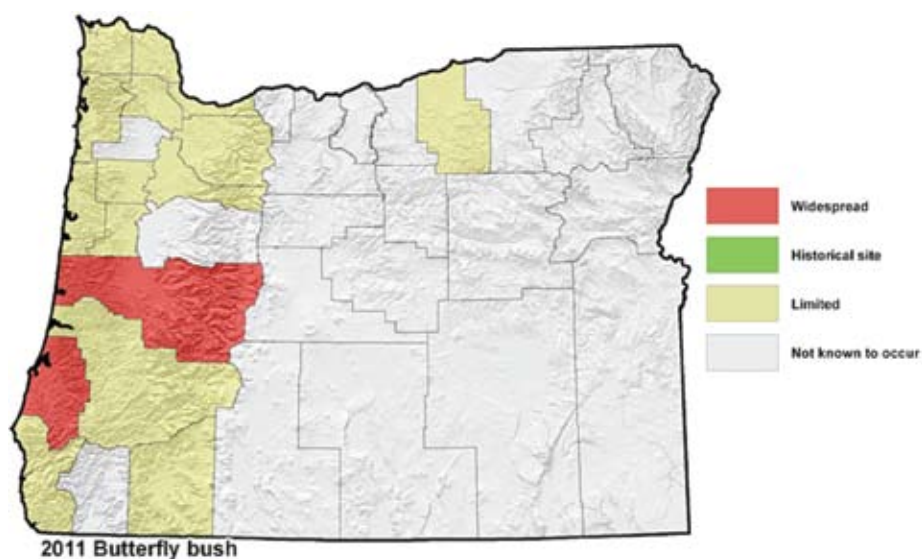


Figure 1. Distribution of *Buddleja davidii* in 2011. COURTESY OF OREGON DEPARTMENT OF AGRICULTURE

terfly bush as a staple for production, coupled with growers' knowledge of breeding work being done across the country, created an impetus for the ODA

to try an exemption for cultivars that were less fertile.

Dan Hilburn, ODA plant regulatory administrator, and others at the ODA

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Plant Division received numerous inquiries about why sterile or nearly sterile cultivars were still banned. While this sounds like a simple task to lift a ban or allow exemptions, it had not been done before by a state Department of Agriculture.

This first-of-its-kind exemption was a joint effort between ODA and OSU to develop the criteria. These criteria state that only ODA-approved *B. davidii* cultivars may be propagated, transported or sold in Oregon. The metric that butterfly bush cultivars must meet is at least 98 percent reduction in viable seeds compared to industry standards such as 'Black Knight' or 'Ile de France'.

We believe that 2 percent or less fertility reduces the threat of escape and invasion to an acceptable level.

In addition to cultivars with low levels of fertility, there are other *Buddleja* species not covered under OAR 603-052-1200. If it can be confirmed that a cultivar is the result of an interspecific cross (at least one parent is not *B. davidii*), then it is not regulated under the Noxious Weed Quarantine.

There are three options available to have butterfly bush cultivars approved. Briefly, these are:

1. An independent evaluation of fertility of the candidate cultivar is completed and the data submitted to ODA for review by an OSU collaborator;
2. A candidate cultivar is submitted for evaluation of fertility by a researcher at OSU, and
3. Supporting information to validate that a candidate cultivar is an interspecific hybrid is submitted to ODA for review by an OSU collaborator.

More details may be found at www.oregon.gov/ODA/PLANT/NURSERY/Pages/buddleja_process.aspx.

Where do these cultivars come from?

As stated above, significant breeding work has been done with *Buddleja* by an esteemed group of breeders, including Dennis Werner, Michael



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David & Patrick

Dirr, John Ruter, Mark Brand, the late Jon Lindstrom and many others.

For brevity, two examples of cultivar development will be described.

'Blue Chip' (Werner and Snelling, 2009) Lo & Behold® was developed at North Carolina State by Dr. Dennis Werner and is marketed under the Proven Winners® brand. 'Blue Chip' is the result of four generations of breeding and selection with a complex pedigree that includes three species.

'Blue Chip' was selected during field trials in 2004 and released in 2007 after considerable evaluation. In addition to the evaluation conducted in Dr. Werner's program, 'Blue Chip' was evaluated under the direction of Dr. Mark Brand at the University of Connecticut.

In their studies, five replicates of 'Blue Chip' were planted in the presence of 10 fertile pollen donor cultivars to ensure that fertile pollen was not limiting. Brand and his colleagues found that 'Blue Chip' had a 98.55 percent reduction in seed production compared to the mean of four other industry standard cultivars (unpublished data). The reduced fertility of 'Blue Chip' comes from its complex pedigree, which is a common result of interspecific hybridization.

A second cultivar of particular interest from a breeding perspective is 'Asian Moon' (Renfro et al., 2007). This cultivar was developed at the University of Arkansas under the direction of Dr. Jon Lindstrom. This cultivar resulted from interspecific and interploidy crosses between *B. davidii* var. *nanboensis* 'Moonshadow', which is a tetraploid, and *B. asiatica*, which is a diploid.

The only seedling that resulted from the cross was aptly named 'Asian Moon' to indicate its pedigree. This cultivar is highly sterile and produces only vestigial capsules and seeds due to the fact that it is both an interspecific hybrid and a triploid. Other, more common triploids include bananas and seedless watermelons.

What's the value?

It bears repeating that butterfly bushes are a favorite of many gardeners and they are asked for by name. Their popularity with many people who buy plants was impacted little by the fact that most cultivars are prolific seed producers with the potential to impact native ecosystems. Gardeners want their carefree growth, prolific flowers, the fragrance and but-



ODA-approved *Buddleja* cultivars

Buddleja 'Blue Chip'
Buddleja 'Asian Moon'
Buddleja 'Purple Haze'
Buddleja 'Ice Chip' (formerly 'White Icing')
Buddleja 'Lilac Chip'
Buddleja 'Miss Molly'
Buddleja 'Miss Ruby'
Buddleja Grande™ Blueberry Cobbler Nectar Bush
Flutterby Grande™ Peach Cobbler Nectar Bush
Flutterby Grande™ Sweet Marmalade Nectar Bush
Flutterby Grande™ Tangerine Dream Nectar Bush
Flutterby Grande™ Vanilla Nectar Bush
Flutterby Petite™ Snow White Nectar Bush
Flutterby™ Pink Nectar Bush

terflies associated with this species.

This strong public desire for butterfly bushes led to sales immediately after ODA instituted its amendment to the ban.

Tim Wood, product development manager at Spring Meadow Nursery in Grand Haven, Mich., estimated that the wholesale value of finished *Buddleja* in Oregon from the Proven Winners line was \$150,000 in 2012, and will be \$250,000 in 2013.

This estimate is based on a single nursery, so it is safe to say that the value will continue to climb as more cultivars with reduced fertility receive exemptions and the general public continues to become more familiar with the idea of an environmentally friendly butterfly bush — or, as they are being marketed now, nectar bush.

Perhaps the greater value is proof of concept. During the discussion to create the criteria, a number of experts who had experience with *Buddleja* were consulted.

Mark Brand made a comment that many places around the country, particularly New England states,

would be watching closely to see how the Oregon experiment went. The hope is that other states with bans at the species level will take note.

Thus far, we are seeing that it just makes good sense (and cents) to allow exemptions for cultivars which have been scientifically tested and shown to have fertility reduced to the point they are no longer an ecological threat. It is possible simultaneously to protect Oregon's valued native lands, allow growers to market an economically important crop, and provide great plants to home gardeners! ☺

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