

'Brightwell' Rabbiteye Blueberry

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'Brightwell', a rabbiteye blueberry clone, (*Vaccinium ashei* Reade), was released in 1981 by Arlen Draper and Max Austin from the cooperative blueberry breeding program of the United States Department of Agriculture, Washington, D.C. and the University of Georgia Coastal Plain Experiment Station, Tifton, Georgia (1, 2). Tested as T-99, 'Brightwell' was selected by W. Thomas Brightwell and James N. Moore in 1963 from the cross 'Tifblue' x 'Menditoo'. The joint release notice (1) described 'Brightwell' as follows: "Plants of 'Brightwell' are vigorous, upright in growth, and produce enough canes to renew the plant. Its berries are medium in size and in blue color, having small dry scars and good flavor. Fruit of 'Brightwell' ripens over a relatively short period beginning after 'Climax' and about the same time as 'Woodard'. ..." It is productive and broadly adapted in the area where rabbiteye blueberries are successful."

Since its release 20 years ago, 'Brightwell' has been widely planted in the southeastern United States and in central Chile. It has replaced 'Tifblue' as the rabbiteye blueberry variety most planted in the United States, although there may still be more 'Tifblue' plants in the ground from earlier plantings. 'Brightwell' is superior to 'Tifblue' in at least two important ways—it is more reliable in fruit set and its ripe berries are more resistant to cracking in rainy weather. In southeast Georgia, 'Brightwell' ripens from mid-early June to mid July (11) and in southeastern North Carolina from July 5 to August 5 (6). The harvest period is about 35 days. The berries can be mechanically harvested for the fresh market if the weather is not rainy (11). The main production areas for rabbiteye blueberries in

the United States are southeastern Georgia and along the Gulf Coast from northeastern Florida to eastern Texas. There is also some rabbiteye production on the coastal plain of North Carolina. In these areas, where late spring freezes frequently damage deciduous fruits 'Brightwell' has enough flower-bud hardiness and flowers late enough that it seldom misses a crop because of late freezes. However, rabbiteye blueberries have a low chill requirement and are more subject to freeze damage in colder areas, where low-chill plants tend to flower before the danger of freezes is past (10). The chilling requirement of 'Brightwell' is low enough to permit it to fruit reliably as far south as Ocala, Florida, where the mean January temperature is about 57°F (14°C).

In the southeastern United States during the last 20 years, yields of commercial rabbiteye blueberry plantings have frequently been reduced by poor fruit set, even in years when flowering was adequate for a full crop. The problem has variously been attributed to freeze damage to the flowers, inadequate cross pollination, and flower damage from thrips (*Frankliniella* spp.) and gall midges (*Dasineura oxycoccana* Johnson). Whatever the problem, and all of the named factors have probably contributed, 'Brightwell' has often had full crops in fields where other varieties had only a partial crop.

The release circular (1) says that 'Brightwell' is self-unfruitful and should not be planted in solid blocks. Low self-fruitfulness is considered typical for rabbiteye blueberries, although varieties such as 'Powderblue' and 'Premier', appear to fruit well in some solid blocks in North Carolina, and 'Brightwell' may be equally self-fruitful in similar situations.

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The History of Rabbit-eye Blueberry Breeding

During the early 1920s, hundreds of thousands of wild rabbit-eye blueberry seedlings were dug from the river valleys of west Florida and planted in fields on upland sites, where they were cultivated with mules (12). Starting about 1910, USDA blueberry breeders in Washington, D.C. began breeding improved varieties of northern highbush blueberry (*V. corymbo-sum* L.) using native plants selected in the region from New England to New Jersey (8). As part of their breeding program, USDA breeders attempted to hybridize highbush selections with various other blueberry species to see what useful traits could be gained. To their surprise, they found that, although their highbush selections closely resembled the Florida rabbit-eyes, highbush x rabbit-eye crosses were relatively hard to make, and the hybrids were much-reduced in fertility (7). This was unexpected since highbush crossed readily and produced hybrids of high fertility with the lowbush blueberry species, *V. angustifolium* Ait., *V. myrsinites* Lam., and *V. hirsutum* Buckley, all of which differed greatly in morphology from both highbush and rabbit-eye (8). These strange crossing results were explained (7) when it was discovered that both highbush and lowbush blueberry were tetraploid ($2n=4x=48$), whereas rabbit-eyes were hexaploid ($2n=6x=72$). How the hexaploid *Vaccinium* species evolved from the diploids and tetraploids has never been exactly determined, but the process appears to have been inevitable enough to have occurred at least three times—once to form hexaploid *V. canadense* in the southern Appalachians, once to form *V. amoenum*, and once to form *V. ashei* (9). The two races of *V. ashei*—the west Florida race and the southeast Georgia race, are sufficiently disjunct, both morphologically and geographically, to suggest that they may also have had separate origins from diploid and tetraploid progenitors.

A collection of wild rabbit-eye selections from Florida and Georgia was planted in 1926 at the Georgia Coastal Plain Experiment Station in Tifton, Georgia (4, 5). The

cooperative breeding program between the Georgia Coastal Plain Station and the USDA was initiated in 1940, when the first crosses were made at Beltsville, Maryland.

The parents of 'Brightwell' are 'Tifblue' and 'Menditoo'. 'Tifblue' ('Ethel' x 'Clara') was released in 1955 from the USDA-Georgia program, and 'Menditoo' ('Myers' x 'Black') was released in 1958 from the USDA-North Carolina state University program. The four grandparents of 'Brightwell' were all selections from the wild (3). 'Black Giant' was selected from west Florida near Crestview. The other three grandparents were from the southeast Georgia race of *V. ashei*. 'Clara' and 'Myers' were selected from the Okefenokee Swamp and Suwannee River area of northeast Florida and southeast Georgia, and 'Ethel' was found along the Satilla River near Brunswick in southeastern Georgia. Most other rabbit-eye cultivars derive entirely or in large part from these same four "land-race" selections. Varieties whose published pedigrees (13) indicate that 100% of their genes derive from two or more of the four selections include: 'Brightwell', 'Powderblue', 'Bluebelle', 'Briteblue', 'Callaway', 'Climax', 'Coastal', 'Gardenblue', 'Homebelle', 'Austin', 'Baldwin', 'Tifblue', 'Premier', 'Southland', 'Woodard', and 'Menditoo'.

The narrow gene base on which rabbit-eye cultivars are based will present major problems for future breeders who wish to continue improvement of the rabbit-eye blueberry. What is needed is a long-term, well-conceived and well-supported breeding program to re-domesticate the species, starting with 50 to 100 unrelated superior wild selections and based on recurrent selection to improve berry and bush qualities. Such a program should not use any selections related to 'Ethel', 'Clara', 'Myers', or 'Black Giant' and should not be expected to generate commercially useful varieties for the first 30 to 50 years (14). Although neither private breeders nor public institutions appear to have the resources and resolve to undertake such a long-term project at present, there is probably no other way to fully exploit the enormous horticultural potential of this remarkable blueberry species.

