

NC 194 Primocane-fruiting Thorny Erect Tetraploid Blackberry Germplasm

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Abstract

'NC 194' is a primocane-fruiting thorny erect tetraploid blackberry that resulted from selfing 'Arkansas 593'. It fruits in both spring/early summer and fall, with a prolonged fall fruiting season in North Carolina. Fruit size is small, fruit quality and firmness are average, and the plant is weak vegetatively. 'NC 194' does not appear to have potential as a fruiting cultivar on its own merits. However, it is potentially valuable as a source of genes for transferring the primocane-fruiting habit to improved tetraploid blackberry genotypes. The primocane-fruiting habit in this genetic background appears to be recessive and simply inherited in tetrasomic fashion, with degree of expression governed by modifier genes.

'NC 194' is a thorny erect tetraploid blackberry (*Rubus* L. subgenus *Rubus* Watson)² (6) genotype that resulted from selfing Arkansas (AR) 593. 'AR 593' resulted from crossing 'Brazos' with 'Hillquist'. 'Brazos' is a thorny erect tetraploid cultivar (1). 'Hillquist' is a diploid erect blackberry genotype originating in the northeastern USA, that fruits on the tips of current season canes (primocanes) in the fall (2). 'AR 593' is tetraploid based on breeding behavior with other tetraploid genotypes, and is one grandparent of the recently released thornless erect tetraploid cultivar 'Arapaho' (4). It apparently resulted from fusion of an unreduced male gamete from 'Hillquist' with a normal reduced egg nucleus from 'Brazos'. The primocane-fruiting trait is common in red raspberries (*Rubus idaeus* L. subgenus *Idaeobatus* Focke), where expression is reported to be governed by either a single

recessive gene or under complex genetic control with expression strongly influenced by temperature and day length (5); however, it has not been described in tetraploid blackberry genotypes up to this time. Neither 'AR 593' nor any of its siblings exhibited the primocane-fruiting trait in Arkansas or North Carolina, indicating that primocane-fruiting from the 'Hillquist' source in blackberry is recessive.

'AR 593' was selfed in a greenhouse at Raleigh, NC, in 1989. The resulting seedlings were established in a field at the Sandhills Research Station, Jackson Springs, NC, in spring 1990. Three out of 46 seedlings established exhibited the primocane-fruiting trait in both 1991 and 1992. 'NC 194' is the one seedling of these three that exhibited the greatest intensity and consistency of expression of the primocane-fruiting trait. Degree of expression in 'NC 194' is much greater than ever observed in 'Hillquist' grown at Raleigh, NC, over a number of years. Given the variation in degree of expression of primocane-fruiting in selfed seedlings of 'AR 593', it appears that this trait is recessive and probably simply inherited in tetrasomic fashion, with expression and degree of expression governed also by a number of modifier genes.

'NC 194' fruits both in spring/early summer and in fall, with a quite prolonged fall fruiting season from late September until frost at Jackson Springs, NC. The fruit is round in shape and fruit size averaged 2.8

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²Blackberries have traditionally been assigned to *Rubus* L. subgenus *Eubatus* Focke, which is an invalid name according to the International Code of Botanical Nomenclature (3). Watson (6) created the subgenus *Rubus* as a valid name for this group.

g/berry in October, 1991 (compared with 5-7 g/berry with spring/summer fruiting standard cultivars). Fruit was average for firmness and quality with typical flavor for a thorny erect blackberry genotype. The plant is weak vegetatively, probably due to a combination of inbreeding depression along with the prolonged expenditure of resources directed toward reproductive effort.

Since it is a weak plant with small fruit of only average quality, 'NC 194' does not appear to have potential as a fruiting cultivar. However, it is the first tetraploid blackberry reported with the primocane-fruiting habit. Therefore it is potentially valuable as a source of genes for transferring the primocane-fruiting trait into improved tetraploid blackberry genotypes.

A limited number of plants of 'NC 194' are available for distribution to blackberry breeders to use as a parent. Breeders requesting plants will be required to sign a memorandum of agree-

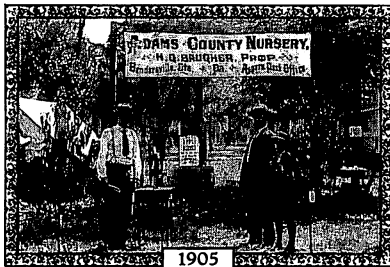
ment prior to receiving plants. Contact Dr. J. R. Ballington, Horticultural Science Department, Box 7609, North Carolina State University, Raleigh, NC 27695-7609 for information on availability of plants.

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