

# 'Carolina Ruby' Sweetpotato

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'Carolina Ruby' is a moist-type sweetpotato [*Ipomoea batatas* (L.) Lam.] developed by North Carolina State Univ. (NCSU). It was evaluated as NC-C75 in regional yield trials by the National Sweetpotato Collaborator Group in 1993, 1994, and 1995. The release of 'Carolina Ruby' provides the industry with a high-yielding, red-skinned, orange-fleshed sweetpotato resistant to fusarium wilt [*Fusarium oxysporum* Schlecht. f. sp. *batatas* (Wollenw.) Snyd. & Hans.] and streptomyces soil rot [*Streptomyces ipomoeae* (Person & W.J. Martin) Waksman & Henrici].

## Origin

'Carolina Ruby' originated in 1988 from an open-pollinated polycross breeding nursery in which 25 genotypes were randomly mated. The female parent of 'Carolina Ruby' is 'Beauregard' (Rolston et al., 1987). The male parent is unknown.

## Description

The following description of 'Carolina Ruby' uses sweetpotato taxonomic and clonal descriptors based on terminology from "Descriptors for Sweet Potato" published by the International Potato Center (Huaman, 1991). 'Carolina Ruby' has entire leaves that are cordate to triangular in shape with no to slight lateral lobes. Leaves are green with some purpling of abaxial veins in immature leaves. Vines and petioles are green with light purple at the apex of the petiole and at the leaf axil. Newly emerging terminal leaves range from slightly to mostly purple. Plants produce a spreading vine, and form storage roots that are of an open-cluster type, with individual roots being elliptic to round-elliptic in shape. The skin color of the roots is red to purple-red,

which lightens slightly during storage. Their flesh color is a uniform dark orange flesh color, which is slightly darker than 'Beauregard' but slightly lighter than 'Hernandez'.

Plants of 'Carolina Ruby' produce adequate flowers and set seed readily, thus no special treatment (e.g., grafting or hormonal treatments) are required for breeding purposes. Flowers have a rounded, white limb with a purple throat. Flower length is  $4.4 \pm 0.5$  cm and flower width is  $3.5 \pm 0.2$  cm. The outer two sepals at the base of the flower are shorter than the inner sepals. Sepal shape ranges from elliptic to obovate, with the apex of the outer sepals being acute in shape and the inner sepals being obtuse; pubescence is absent and they are green in color. The slightly exerted stigma is white, and the style is white at the base and purple at its apex.

The skin of storage roots is smooth, but in wet growing conditions water blisters around the root lenticels are formed, which are fewer but larger than those seen in 'Hernandez'. Storage root dry matter of 'Carolina Ruby' averages  $19.9\% \pm 1.3\%$  compared with  $18.2\% \pm 1.1\%$  and  $22.5\% \pm 1.5\%$  for 'Beauregard' and 'Jewel', respectively.

## Performance

'Carolina Ruby' was compared with 'Beauregard' and 'Jewel' in trials using a randomized complete-block design with four or six replications in Johnston, Lenoir, Nash, New Hanover, and Sampson counties in North

Carolina. These trials covered a wide range of soil types, planting dates, and growing days. Yield and grade of 'Carolina Ruby' consistently compared favorably with 'Beauregard' and was superior to 'Jewel' (Table 1). Differences between 'Carolina Ruby' and 'Beauregard' in yield of U.S.#1 grade roots were statistically significant ( $P \leq 0.05$ ) in six of the 16 trials conducted, and in five of these, 'Carolina Ruby' produced the higher yield. There were statistically significant ( $P \leq 0.05$ ) differences in U.S.#1 grade roots between 'Carolina Ruby' and 'Jewel' in six of the 16 trials, with 'Carolina Ruby' yielding more than 'Jewel' in all of these. 'Carolina Ruby' was an entry in the 1993-95 National Sweetpotato Collaborators trials (McLaurin, 1993, 1994, 1995). At 12 locations in 1993, 10 in 1994, and 14 in 1995 both 'Beauregard' and 'Jewel' were standards for comparison (Table 2). The yield of 'Carolina Ruby' was similar to that of 'Beauregard' for the U.S.#1 and canner grades and slightly higher for the jumbo grade in 1994 and 1995 (Table 2). 'Carolina Ruby' yielded more than 'Jewel' in both U.S.#1 and jumbo grades. Harvest dates for 'Carolina Ruby' are typically 3 to 5 d earlier than 'Beauregard' when both cultivars are planted on the same date, as indicated by the production of more jumbo grade roots at harvest (Table 1).

Roots of 'Carolina Ruby' store well without excessive weight loss from storage rots or dehydration. Baked roots have uniform color, a moist smooth flesh, and good taste, as judged by independent taste tests conducted by panelists at NCSU (unpublished results). Bedded roots produce sprouts similar in number to 'Jewel' that are ready a few days earlier than 'Jewel' and  $\approx 10$  d earlier than 'Beauregard'.

## Disease and insect reactions

In greenhouse disease evaluations routinely conducted by the NCSU breeding program

Table 1. Marketable yields of 'Carolina Ruby' and two other sweetpotato cultivars in replicated trials conducted in North Carolina during 1993-96.

Cultivar	Avg yield $\pm$ SE (t-ha <sup>-1</sup> ) <sup>a,y</sup>			Total marketable
	U.S.#1	Canner	Jumbo	
	1993			
Carolina Ruby	27.2 $\pm$ 1.0	9.7 $\pm$ 3.8	5.1 $\pm$ 2.9	42.0 $\pm$ 5.2
Beauregard	22.2 $\pm$ 6.9	12.0 $\pm$ 0.8	2.9 $\pm$ 2.5	37.1 $\pm$ 9.3
Jewel	17.9 $\pm$ 5.7	8.1 $\pm$ 1.5	0.7 $\pm$ 1.1	26.7 $\pm$ 5.8
	1994			
Carolina Ruby	27.5 $\pm$ 4.9	5.7 $\pm$ 0.7	8.3 $\pm$ 3.2	41.5 $\pm$ 6.7
Beauregard	19.2 $\pm$ 3.4	7.3 $\pm$ 0.4	5.4 $\pm$ 4.8	31.9 $\pm$ 8.2
Jewel	20.1 $\pm$ 7.7	6.2 $\pm$ 2.9	6.1 $\pm$ 5.4	32.4 $\pm$ 10.5
	1995			
Carolina Ruby	20.8 $\pm$ 13.6	4.4 $\pm$ 1.2	8.3 $\pm$ 9.4	33.5 $\pm$ 22.5
Beauregard	22.2 $\pm$ 11.0	6.5 $\pm$ 3.9	2.9 $\pm$ 3.4	31.5 $\pm$ 14.4
Jewel	18.2 $\pm$ 13.7	5.5 $\pm$ 2.7	2.7 $\pm$ 3.5	26.4 $\pm$ 15.2
	1996			
Carolina Ruby	30.4 $\pm$ 4.2	8.7 $\pm$ 3.5	5.0 $\pm$ 2.7	44.1 $\pm$ 5.3
Beauregard	28.6 $\pm$ 5.8	9.3 $\pm$ 2.4	4.0 $\pm$ 2.4	41.9 $\pm$ 8.2
Jewel	20.1 $\pm$ 1.7	9.7 $\pm$ 5.1	1.9 $\pm$ 2.1	31.7 $\pm$ 4.3

<sup>a</sup>Average of three trials in 1993, four in 1994, six in 1995, and four in 1996; t-ha<sup>-1</sup>  $\times$  17.84 = no. of 50 lb. bu. per acre.

<sup>y</sup>Root sizes: U.S.#1: 51-89 mm in diameter, 76-229 mm long; canner: 25-51 mm in diameter, 51-178 mm long; jumbo: larger in diameter or length than U.S.#1, and without objectionable defects.

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Table 2. Marketable yields of 'Carolina Ruby' and two other cultivars in the National Sweetpotato Collaborators regional trials conducted during 1993-95.

Cultivar	Avg yield ± SE (t·ha <sup>-1</sup> ) <sup>z,y</sup>			
	U.S.#1	Canner	Jumbo	Total marketable
	1993			
Carolina Ruby	19.4 ± 6.2	8.2 ± 4.6	5.1 ± 5.8	32.7 ± 11.7
Beauregard	19.9 ± 6.1	8.6 ± 5.4	5.1 ± 5.3	33.6 ± 14.0
Jewel	15.4 ± 8.2	8.3 ± 5.3	1.3 ± 1.6	25.2 ± 12.4
	1994			
Carolina Ruby	24.2 ± 7.9	7.8 ± 3.6	7.7 ± 5.0	39.6 ± 8.8
Beauregard	23.1 ± 8.8	8.8 ± 3.6	4.3 ± 4.2	36.3 ± 9.2
Jewel	17.8 ± 7.7	8.9 ± 4.0	3.5 ± 5.5	30.2 ± 10.0
	1995			
Carolina Ruby	22.5 ± 11.4	6.5 ± 3.6	8.0 ± 7.5	36.9 ± 17.5
Beauregard	20.9 ± 9.7	7.3 ± 4.3	4.6 ± 3.7	32.8 ± 13.3
Jewel	15.7 ± 10.0	7.5 ± 4.6	2.5 ± 2.8	25.7 ± 11.9

<sup>z</sup>Average of 12 trials in 1993, 10 in 1994 and 14 trials in 1995; t·ha<sup>-1</sup> × 17.84 = no. of 50 lb. bu. per acre.  
<sup>y</sup>Root sizes: U.S.#1: 51-89 mm in diameter, 76-229 mm long; canner: 25-51 mm in diameter, 51-178 mm long; jumbo: larger in diameter or length than U.S.#1, and without objectionable defects.

(unpublished results), 'Carolina Ruby' is highly resistant to fusarium wilt, similar to 'Jewel' and 'Beauregard'. It is moderately resistant to soil rot caused by *Streptomyces ipomoeae*, similar to 'Beauregard'. It is susceptible to the southern root-knot nematode, *Meloidogyne incognita* (Kofoid & White) Chitwood. Field

observations indicate that 'Carolina Ruby' is susceptible to the white grub species *Plectris aliena* Chapin and the wireworm, *Diabrotica*, *Systema* complex (McLaurin, 1994). It appears to have moderate resistance to the sweetpotato flea beetle (*Chaetocnema confinis* Crotch) (McLaurin, 1994).

**Availability**

Limited quantities of seed roots are available from NC Foundation Seed Producers, 8220 Riley Hill Road, Zebulon, NC 27697. Limited quantities of tissue-cultured plantlets are available from the NCSU Sweetpotato Breeding and Genetics Program, Box 7609, Horticulture Dept., NCSU, Raleigh, NC 27695-7609.

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