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'REGAL' SWEET POTATO¹

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INTRODUCTION

'Regal' sweet potato [Ipomoea batatas (L.) Lam.] was developed jointly by the U. S. Department of Agriculture, the South Carolina Agricultural Experiment Station, and the Texas Agricultural Experiment Station. This cultivar has high yields and excellent baking flavor in combination with high levels of resistances to a wide array of diseases and insects.

ORIGIN

'Regal', previously tested as W-152, originated as an open-pollinated seedling of W-99 polycrossed in Charleston, South Carolina in 1977 with 29 other parental selections that had multiple disease and soil insect resistances. W-99 was a selection from the 1974 polycross of 30 parents and is an open-pollinated seedling of a South Carolina Agricultural Experiment Station breeding line (SC 1166). Because of the open pollinations, an exact pedigree for 'Regal' is not available.

DESCRIPTION

'Regal' has moderate vine length, large green stems, and vigorous growth with good foliage density. Leaves are of moderate size, entire and green with dark purple veins on the lower surface. At harvest, 'Regal' has a brilliant purplish-red skin, thus its name. It retains an attractive dark red color in storage. Roots are generally well shaped, fusiform to blocky, but sometimes short with a tendency to be round. Under most environmental conditions it develops a dark orange flesh, but in some trials in Alabama, Mississippi, and Louisiana, the flesh color has been a lighter orange. Marketable root yields are often 5-10 percent higher than 'Jewel' (Table 1). It stores acceptably well but not as long as 'Jewel', probably due to a slightly lower (2-3%) dry matter percentage. Average baking and canning scores are similar to that of 'Jewel' with baking flavor better and orange

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color slightly less. Sprouting is about like that of 'Jewel'. Flowering is sufficient for breeding purposes with no special treatment needed.

DISEASE AND INSECT RESISTANCES

The combination of pest resistances of 'Regal' is superior to that of other available cultivars, including 'Resisto', and the levels of resistances are generally higher than those of 'Resisto'. 'Regal' is similar to 'Resisto' in its resistance to internal cork, a viral disease, and to fusarium wilt, or stem rot, caused by the soil-borne fungus Fusarium oxysporum f. sp. batatas (Wr.) Snyder & Hans. It is less susceptible than 'Resisto' to sclerotial blight incited by Sclerotium rolfsii Sacc. in plant beds. It has a low level of resistance to pox, or soil rot, caused by Streptomyces ipomoea (Person & W. J. Martin) Waks. & Henrici; it is more resistant than 'Centennial', 'Jewel', or 'Resisto', but is not as resistant as 'Jasper'. It is more resistant than 'Resisto' to southern root-knot [Meloidogyne incognita (Kofoid & White) Chitwood]. In South Carolina trials, in the presence of high infestation levels of race 3 southern root-knot nematode, 'Regal' often had higher yields than 'Jewel', sometimes twice that of 'Jewel'. Under California environmental conditions, such yield differences were not apparent in root-knot infested soils. We conclude that the level of root-knot resistance of 'Regal' is at least equal to that of 'Jewel' and under some environmental conditions better.

'Regal' is generally more highly resistant than 'Resisto' to the following soil insects: the WDS complex (wireworm-Diabrotica-Systema) which includes the southern potato wireworm (Conoderus falli Lane), the tobacco wireworm (C. vespertinus Fabricius), the banded cucumber beetle (Diabrotica balteata LeConte), the spotted cucumber beetle (D. undecimpunctata howardi Barber), the elongate flea beetle (Systema elongata Fabricius), the pale-striped flea beetle (S. blanda Melsheimer), S. frontalis Fabricius (a flea beetle), and to the sweet potato flea beetle (Chaetocnema confinis Crotch). It has high levels of resistance similar to that of 'Resisto' to larvae of at least 2 species of white grubs, Plectris aliena Chapin, and Phyllophaga ephilida Say. 'Regal' has a moderate level of resistance to the sweet

potato weevil, Cylas formicarius elegantulus (Summers) similar to that of 'Resisto'.

In trials conducted over 3 years where the highly susceptible SC 1149-19 was used to estimate maximum soil insect damage, the resistance of 'Regal' provided 78% control of the WDS complex of insects compared to 63% by 'Resisto' and 32% by 'Jewel'. In the same trials the resistance of 'Regal' provided 93% control of sweet potato flea beetle compared to 52% by 'Resisto' and 62% by 'Jewel'. With these high levels of resistances, 'Regal' has averaged 85% of its roots free of all insect damage, compared to 50% for 'Jewel' or 'Centennial' when no chemical control was used in South Carolina trials where injury from white grubs was minimal. In trials conducted in Louisiana for 3 years, 'Regal' averaged 1% of its roots damaged by white grubs compared to 41% damaged in 'Centennial' (98% control).

AVAILABILITY

Foundation seed stocks in limited quantities will be commercially available for the 1985 crop season. Requests for roots or vines should be made to the South Carolina Foundation Seed Association, Clemson, SC 29631. No planting material will be available from USDA.

Table 1. Yield comparisons of 'Regal' and 'Jewel' from 1981, 1982, and 1983 regional trials.

Year	Cultivar	Yield (MT/ha) ^z				
		US #1	Canners	Jumbo or over size	Marketable	Culls
1981	Regal	13.6	8.3	2.2	24.1	3.6
	Jewel	12.7	7.2	3.4	23.3	3.2
1982	Regal	18.9	8.1	3.8	30.8	2.6
	Jewel	18.9	7.0	2.9	28.8	2.2
1983	Regal	15.7	8.4	2.0	26.1	3.1
	Jewel	15.6	6.1	2.7	24.4	3.4
Avg.	Regal	16.1	8.3	2.6	27.0	3.1
	Jewel	15.8	6.8	3.0	15.5	2.9

^zAverages from 12 locations in 1981, 18 in 1982, and 21 in 1983; replications per location in 1981, 1-5 (2.7 average); in 1982, 3-6 (4.1 average); and in 1983, 4-5 (4.0 average). MT/ha x 0.446 = tons per acre.