Male Asparagus Hybrids: 'Jersey Gem', 'Jersey General', 'Jersey King', 'Jersey Knight', and 'Jersey Titan'

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Five male asparagus hybrids described herein are new members of the series that began with the release of 'Jersey Giant' (Ellison and Kinelski, 1985) and 'Greenwich' (Ellison and Kinelski, 1986). Male hybrids are extremely desirable because they result from controlled pollination and only F₁ seed is available to growers. The integrity of the dioecious cultivars Mary Washington and Martha Washington was lost because growers saved seed from random pollinations (Norton, 1913). Male hybrids are generally higher yielding (Ellison and Scheer, 1959) than dioecious hybrids due to diversion of photosynthate to seed production in female plants. Males also live longer (Ellison and Scheer, 1959) and do not produce seedlings that behave as weeds in the production field.

Origin

All five hybrids have the patented supermale 'Scott Howard' (tested as No. 22-8) as the pollen parent (Ellison and Kinelski, 1985).

The seed parent of 'Jersey Gem', named 'Kathryn' (tested as No. G27), was selected for vigor and rust resistance in an old commercial field of 'Mary Washington' asparagus near Greenwich, N.J. 'Linda' (No. 277C) and 'Tara' (No. 277E) are the seed parents of 'Jersey Knight' and 'Jersey Titan', respectively. Both 'Linda' and 'Tara' were selected for rust and fusarium resistance from the cross 14 × 30, two plants selected for rust resistance and vigor in old commercial fields of 'Mary Washington' asparagus in southern New Jersey. 'Jersey General' has the plant 'Louise' (No. 362M) as the seed parent. 'Louise' was selected for rust and fusarium resistance from the cross 14 female × 14 male, two old 'Mary Washington' plants selected for vigor and 'rust resistance'. The seed parent of 'Jersey King' is named 'Jersey Queen' (tested as No. Md 10), which was selected for outstanding vigor and rust resistance in an old commercial field of 'Mary Washington' on the eastern shore of Maryland.

Disease reaction and yield

The five new hybrids, 'Jersey Gem', 'Jersey General', 'Jersey King', 'Jersey Knight', and 'Jersey Titan' all have similar resistance to rust (*Puccinia asparagi*) and tolerance to root and crown rot (*Fusarium oxysporum* f. sp. *asparagi*) and stem and crown rot (*F. moniliforme*), as do 'Jersey Giant' and

'Greenwich' (personal observation). Note that all seven hybrids have the same pollen parent. Rust ratings were made in 1985 at Bridgeton, N.J. 'Jersey Titan', 'Jersey Knight', and 'Jersey General' all showed more tolerance to rust (ratings of 5.0-6.6 on a scale of 9 = rust free, 1 = very rusty) than 'Mary Washington' (rating of 3.0). 'Jersey Gem' and 'Jersey King' were not included in this trial.

The new asparagus hybrids were tested at four locations within New Jersey (see Table 1) and four locations outside New Jersey (see Table 2). The soils at all locations within New Jersey had been previously planted to asparagus and were naturally infested with *Fusarium oxysporum* Schlecht f. sp. *asparagi* Cohen and *Fusarium moniliforme* Sheldon. The yield data in Tables 1 and 2 are means of 2 to 7 years of harvesting, depending on location.

At the first site near Bridgeton, N. J., 'Jersey General' and 'Jersey Knight' yielded more than 'Jersey Titan' or 'Mary Washington' (Table 1). In Gloucester County, N.J., 'Jersey General' yielded more than all other cultivars, and 'Greenwich' yielded more than 'Mary Washington'. 'Jersey Giant' and 'Greenwich' produced more marketable yield than 'Mary Washington'. In Salem County, N. J., 'Greenwich' and 'Jersey Gem' produced more marketable yield than 'Jersey Giant' and more jumbo and marketable yield than 'Jersey King' and 'Mary Washington'. 'Jersey King' was not significantly different from 'Mary Washington'. At the second site near Bridgeton, 'Jersey Giant' outyielded 'Jersey King' and 'Mary Washington'. 'Jersey Gem' and 'Greenwich' were not significantly different from 'Jersey Giant' (Table 1).

At locations outside New Jersey, 'Jersey Gem' ranked with the highest-yielding hybrids in Michigan, North Carolina, and Oklahoma, falling short only in Ontario (Table 2). 'Jersey Giant' yielded well at three of four locations. 'Jersey King' was not significantly different from 'Jersey Gem' in Michigan. 'Jersey Titan' and 'Jersey Knight' were the highest-yielding hybrids in Ontario.

Local adaptation is critical with aspara-

Table 1. Yield of new asparagus male hybrids and standard cultivars grown on Fusarium-infested soil at four locations in New

Cultivar	Bridgeton ^a		Gloucester County ^a		Salem County ^a		Bridgeton ^a	
	Jumbo ^b	Market ^c	Jumbo	Market	Jumbo	Market	Jumbo	Market
	Yield (kg·ha ⁻¹) ^d							
Jersey General	321 a	1210 a	849 a	1720 a				
Jersey Knight	238 a	1200 a						
Jersey Titan	69 b	645 b						
Greenwich			480 b	1210 b	890 a	1830 a	2190 a	5530 ab
Jersey Giant			378 bc	1180 b	690 a	1340 b	2300 a	6500 a
Jersey Gem			385 bc	980 bc	726 a	1780 a	1720 ab	4720 ab
Jersey King					241 b	862 c	795 bc	3170 b
Mary Washington	26 b	278 c	198 c	646 c	401 b	1020 c	490 c	2540 b

^aFive replications harvested for 6 weeks.

^bTwo replications harvested for 2 weeks.

^cThree replications harvested for 2 weeks.

^dFour replications harvested for 6 weeks.

^eJumbo spears ≥ 16 mm diameter, 18 cm long.

^fMarket spears ≥ 10 mm diameter, 18 cm long.

Mean separation within columns by Duncan's multiple range test, *P* = 0.05.

Table 2. Yield of new asparagus male hybrids and standard cultivars grown on *Fusarium* -free soil at four widely separated locations in North America.^z

Cultivar	Location			
	Ontario ^y	Michigan ^x	North Carolina ^w	Oklahoma ^v
	<i>Marketable yield (kg-ha⁻¹)^y</i>			
Jersey Titan	1980a			
Jersey Knight	1840 ab			
Jersey King		4780 a		
Jersey Gem	1320 cd	4980 a	2920 a	5880 a
Jersey Giant	1600 bc	5100 a	1860 b	6490 a
Greenwich	1610 bc	3650 b	2190 b	4740 ab
Mary Washington	1180 d	1280 c	1070 c	2260 b

^zLength of-harvest season was 6 weeks. Criteria for marketability varied with location, but was the same for all cultivars at each location.

^yGuelph, Ont., Canada, five replications.

^xSodus, Mich., six replications.

^wClinton, N.C., seven replications.

^vBixby, Okla., four replications.

^yMean separation within columns by Duncan's multiple range test, $P = 0.05$.

gus. Certain of the new male hybrids reported in this paper are much better adapted to some environments than to others. 'Jersey Titan', for example, performed very well in Ontario (Table 2), whereas in Bridgeton, it performed poorly (Table 1). 'Jersey King' yielded well in Michigan (Table 2), whereas in Salem County and Bridgeton, 'Jersey King' was low yielding (Table 1). 'Jersey Gem' was the highest-yielding hybrid in North Carolina and performed well in Michigan and

Oklahoma (Table 2) and in Salem County (Table 1). However, 'Jersey Gem' yielded poorly in Ontario (Table 2) and in Gloucester County (Table 1). Researchers and growers in areas not reported above are advised to establish trial plantings of each of the new hybrids to determine which ones perform best under local growing conditions. Many of the differences in yield attributable to location were very large. This can be due to variations in the soil type, soil history (whether

Fusarium -infested or virgin to asparagus), rainfall, prevailing temperatures, or other climatological factors. One reason environmental effects are so pronounced with asparagus is that they are cumulative due to the perennial nature of the crop.

Availability

'Jersey Gem' and 'Jersey Knight' are patented and licensed for seed production by Jersey Asparagus Farms, Inc., PO Box 307, RFD No. 3, Newfield, NJ 08344. 'Jersey General', 'Jersey Titan', and 'Jersey King' are patented and licensed for seed production by Nourse Farms, Inc., Box 485, RFD, South Deerfield, MA 01373.

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