Cucumber Inbred Line USDA 6632E

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Release Announcement: Line 6632E, a multiple-disease resistant, gynoecious, processing cucumber (*Cucumis sativus* L.) inbred is being released by the U. S. Department of Agriculture Agricultural Research Service to provide breeders with a line having high fruit quality and multiple disease resistance to produce hybrid cultivars and germplasm for breeding purposes. The disease resistance attributes of USDA 6632E originates from previously released USDA inbred lines WI 1379 (4), 'Wautoma' (2), and WI 2870 (3). The resistance identified in greenhouse evaluation for anthracnose and angular leaf spot has been confirmed in field tests at the University of Wisconsin Experiment Station, Hancock, WI (HES).

Origin: USDA 6623E originated from a cross made in 1987 between the multiple disease resistant USDA line 3733 and the monoecious multiple disease resistant line, 'Wautoma'. The F_1 hybrid was self-pollinated to produce F_2 progeny that were selected at HES in 1988 for gynoecious and high fruit quality characteristics (e.g., fruit length and small seed cavity). Rooted cuttings of selected plants were crossed to the gynoecious, multiple disease resistant USDA line 2870. Subsequently, the progeny from this cross were selected for gynoecious and high fruit quality at HES in 1990. Selections were subjected to continued selection for these characteristics and self-pollinated to produce F_5 inbred lines and then increased under cage isolation to produce seed for replicated trials (Table 1).

Description of inbred lines used to create USDA 6632E: Line 3733 [(USDA line 1983 x Gy-2)F_6] is gynoecious, indeterminate, and produces non-bitter, white-spined fruit of a length:diameter ratio (L:D) equal to 3.0 (not released). The gynoecious, multiple disease resistant USDA line 1983 was released in 1983 (1). Line 3733 is resistant to angular leaf spot [*Pseudomonas lachrymans* (E.F. Smith and Bryan) Carsner; ALS], anthracnose [*Colletotrichum orbiculare* (Berk. & Mont.) Arx; AN], cucumber mosaic virus (CMV), *downey mildew* [Pseudoperonospora cubensis (Berk. & Curt.) Rostow; DM], *powdery mildew* [*Sphearotheca fuliginea* (Schlechet. Ex Fr.) Poll.; PM], and Scab (spot rot) (*Cladosporium cucumerinum* Ellis & Arthur; SC). Line 1379 {[(3121 x Gy14) x $Gy14^2$]S_4} is indeterminate, resistant to SC, CMV, PM, DM, ALS, AN and produces non-bitter, white-spined fruit of L:D 3.0. The indeterminate, disease resistant (SC, CMV, PM, AL, AN, DM) line 2870 produces white-pined, non-bitter fruit of L:D 3.0. 'Wautoma' is resistant to eight destructive diseases including SC, CMV, ALS, DM, PM, AN, fusarium wilt [*Fusarium oxysporum* (Schlect.) Synd. & Hans.] and TLS [*Corynespora cassiicola* (Berk. & Curt.)], and produces non-bitter, white-spined fruit of L:D 3.1.

Description of USDA 6632E: Line 6632E is indeterminate, gynoecious and resistant to ALS, AN, DM, CMV, PM, and SC. It is has field resistance to TLS. Fruit average about 3:0 in L:D (Table 1); are bitter free, white-spined, typically moderate to dark green depending on growing environment, and nearly cylindrical. Line 6632E flowers about the same time as 'Vlasset'. In our 1997 to 2000 trials, line 6632E preformed as well as standard monoecious hybrids evaluated for fruit yield and brining quality. Line 6632E has been tested in hybrid combination with lines 6812A and 6849A to produce hybrids that are competitive with the fruit yield and quality of 'Vlasset' and other standard commercial cultivars (data not shown).

Availability: Breeder's seed, produced under screen isolation, will be provided to U.S. hydrid-seed producers and cucumber breeders by J.E. Staub, ARS/USDA, Dept. of Horticulture, Univ. of Wisconsin, Madison, WI 53706.

Literature Cited

1. Peterson, C. E., J. E. Staub, P. H. Williams, and M. J. Palmer. 1986. Wisconsin 1983 cucumber. HortScience 21:1082-1083.

2. Peterson, C. E. and J. E. Staub. 1986. 'Wautoma' cucumber. HortScience 21:326.

3. Staub, J. E. 1988. Processing cucumber inbred line WI 2870. USDA, ARS release announcement.

4. Staub, J. E. 1991. Cucumber germplasm: nearly-isogenic normal and little leaf lines WI 1379G, WI 1983G, and WI 2238G. USDA, ARS release announcement.

Table 1.Comparative means and LSDs over evaluation seasons for USDA line 6632E and various experimental (M21 and 2870) and a commercial cucumber hybrids.

		Days to	Avg of 4 Harvests[z]			Overall	Firmness[v]	
Trial year	Trial entry	flower	No.	Wt.[y]	L/D	brine rating[w]	Blossom	Stem
2000	6632E A X M21	39.8	9.6	2.0	3.0	2.4	19.1	20.5
	6632 E	39.8	9.6	1.6	2.8	2.8	19.5	20.0
	Vlasset	40.2	9.6	1.8	2.9	3.5	20.9	22.3
	LSD (0.05)	3.1	1.8	0.4	0.1	0.4	1.7	2.2
1999	6632E X M21	38.5	8.0	1.7	3.0	2.8	17.2	18.0
	6632E X 2870	38.8	8.0	1.8	2.8	3.1	19.4	19.2
	6632E	38.8	7.8	1.4	2.9	3.4	19.3	20.6
	Vlasset	39.2	8.1	1.6	2.7	3.1	20.2	21.8
	LSD (0.05)	1.6	1.4	0.4	0.1	0.4	2.4	2.6
1998	6632E X M21	39.3	10.8	2.0	3.1	2.2	14. 8	14.8
	6632E X 2870	38.8	8.7	2.1	2.8	2.9	16.6	16.7
	6632E	39.2	7.6	1.1	2.9	1.7	13.8	14.0
	Vlasset	39.7	8.8	1.6	2.8	2.7	17.3	18.2
	LSD (0.05)	1.5	1.9	0.7	0.3	0.4	2.0	2.4
1997	6632E X M21	42.0	6.5	1.4	3.2	3.7	14.4	17.2
	6632E X 2870	42.8	6.5	1.4	3.0	2.9	15.1	17.2
	6632E	40.5	7.1	1.2	3.0	3.3	11.8	15.3
	Vlasset	39.0	7.5	1.4	2.8	3.7	15.7	17.1
	LSD (0.05)	1.5	1.8	0.5	0.2	0.4	2.0	2.5

[z] Fruit number and weight presented on a per plant basis where plants were set at approximately 20,000 plants per acre. L/D = length:diameter ratio.

[y]Weight in pounds.

[w]Data are means over 12 judges and 3 replications. Fruit scored 1 to 5, where 1 = excellent 3 = moderate, and 5 = unacceptable.

[v]Punch test using Magness-Taylor pressure tester, with 7.9 mm tip. Average for ten, 38-mm diameter fruits, taken from each replication at 3rd harvest.