UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE CAPE MAY PLANT MATERIALS CENTER CAPE MAY COURT HOUSE, NEW JERSEY

NOTICE OF RELEASE OF SOUTHAMPTON GERMPLASM PRAIRIE CORDGRASS

SELECTED CLASS OF NATURAL GERMPLASM

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) announces the release of a selected ecotype of prairie cordgrass (*Spartina pectinata* Bosc ex Link) for the Mid-Atlantic ecoregion. Southampton Germplasm prairie cordgrass was tested under the accession number 9046803.

This plant will be referred to as Southampton Germplasm prairie cordgrass and is released as a selected plant material class of vegetative propagules and certified seed (natural track).

This alternative release procedure is justified because there are limited commercial sources of prairie cordgrass. The potential for immediate use is high especially for wetland restoration and enhancement, streambank and shoreline stabilization, and critical area stabilization.

Collection Site Information: Southampton Germplasm is a composite of three accessions (9051735, 9051736, and 9051742) collected by NRCS personnel from native plant stands in November 1992. The three collection sites are located around the Mecox Bay area of Long Island, NY. At the collection sites American beachgrass (*Ammophila breviligulata*), saltmeadow cordgrass (*Spartina patens*), and common reed (*Phragmites australis*) grow in association with prairie cordgrass. Collections were made from stands occurring below the mean high tide line.

Description: Prairie cordgrass is a warm season, perennial grass reaching heights of 4 to 6 feet at maturity. The leaf blades are rough and measure 8 to 24 inches long. During dry conditions, leaf edges may roll inward along the central vein forming a tube.

Prairie cordgrass flowers from July to September. Seedheads composed of 6 to 20 spikes form in late summer and are attached to a main stem 1.5 to 2.5 inches long. The spikes are comprised of up to 40 spikelets arranged in 2 rows on the outside of the spike. The seedhead of prairie cordgrass resembles that of big cordgrass (*Spartina cynosuroides*), however is differentiated by the angle of the spikes to the stem. The seedhead of prairie cordgrass is somewhat appressed usually forming angles of 45 degrees or less while that of big cordgrass is more spreading with spikes at nearly right angles to the stem.

Prairie cordgrass primarily spreads by means of rhizomatous growth, reaching up to 2 feet in a growing season. Under ideal growing conditions, it may form nearly pure stands that grow from dense mats of an intertwined rhizome system. The numerous and much branched rhizomes have a scaly appearance and feel. They produce numerous tillers and spikes to form new plants.

Prairie cordgrass has been documented to have some degree of salt tolerance and is well adapted to brackish and fresh water marshes, along streams, lake edges, and wet meadows. It grows on a wide range of soil textures from sandy soils to fine clays to silt loams. Prairie cordgrass often grows in association with reed grass (*Phragmites* spp.), sedges (*Carex* spp.), and switchgrass (*Panicum virgatum*).

Potential Uses: The stiff stems, vigorous rhizomes and robust size of the Southampton Germplasm make it a useful species in stabilizing soil, dissipating wave energy and providing cover for applications such as: wetland restoration and enhancement, streambank and shoreline stabilization, spillways, berms, dikes and dams, filter strips, riparian buffers, wildlife habitat – nesting and cover, and early season forage.

Method of Selection:

Initial evaluation: Southampton Germplasm was evaluated at the USDA NRCS, Big Flats Plant Materials Center (PMC), Corning, New York, from 1994 through 1997. Fifty-three accessions of prairie cordgrass were collected from six states (New York, New Hampshire, Massachusetts, Maine, Pennsylvania, and Delaware) and Quebec, Canada. After one growing season accessions were evaluated for survival, vigor, height, and tiller number (Table 1). Plants were evaluated in the second year for percent survival, vigor, leaf height, disease resistance, spreading ability, seed head height, and flower abundance (Table 2). Flower abundance, disease resistance, and spreading ability were evaluated qualitatively by assigning a number rating of one (best performance) to nine (worst performance). Initial evaluations showed accession 9051742 to be superior for vigor, height, flower abundance, and spreading ability. Accession 9051742 along with accessions 9051735 and 9051736 added for genetic diversity from Long Island, NY were established in a seed increase block at the Big Flats PMC in 1998. The resulting Southampton Germplasm was assigned accession number 9046803.

Table 1. Initial evaluations of prairie cordgrass evaluated on September 8, 1994 at the Big Flats Plant Materials Center.

Accession #	# planted	% Survival	Vigor	Ht(cm)	Tiller #	Accession #	# planted	% Survival	Vigor	Ht(cm)	Tiller #
9051702	10	70	5	60	5	9051729	6	100	5	70	5
9051703	9	89	4	53	7	9051730	18	94	5	45	4
9051704	8	88	4	65	4	9051731	11	82	4	50	5
9051705	5	100	5	65	9	9051732	16	88	3	85	12
9051706	9	89	5	60	5	9051733	6	70	3	62	3
9051707	2	100	2	103	11	9051734	2	100	2	34	4
9051708	9	78	9	30	7	9051735	27	78	1	50	2
9051709	13	90	4	60	4	9051736	3	100	2	60	5
9051710	13	92	4	65	8	9051737	6	83	5	50	3
9051711	16	94	2	50	11	9051738	2	50	5	40	3
9051712	15	40	9	23	3	9051739	5	60	5	105	6
9051713	14	79	9	26	5	9051740	13	85	6	37	3
9051714	17	94	5	65	4	9051741	5	100	8	30	3
9051715	1	100	8	3	2	9051742	14	86	3	115	3
9051716	14	86	5	65	2	9051743	12	92	5	55	8
9051717	13	85	2	65	9	9051744	19	89	2	85	11
9051718	18	72	6	75	6	9051745	10	80	4	85	6
9051719	12	92	6	30	8	9051746	8	100	5	55	6
9051720	17	100	7	25	7	9051747	17	88	3	50	12
9051721	12	83	7	27	4	9051748	14	93	5	50	4
9051722	12	742	6	35	6	9051749	5	100	7	23	1
9051724	20	95	3	55	5	9051755	3	67	7	32	1
9051725	7	86	4	50	5	9051759	5	60	5	50	5
9051726	10	60	9	35	2	9051763	5	20	9	10	2
9051727	6	83	8	40	3	Control	13	92	2	65	7

Table 2. Initial evaluations of prairie cordgrass evaluated on 8/4/95 at Big Flats Plant Materials Center

Accession #	# planted	% Survival	Vigor	Leaf Ht (cm)	Flower Ab	Disease	Spread	Accession #	# planted	% Survival	Vigor	Leaf Ht (cm)	Flower Ab	Disease	Spread
9051702	11	60	6	90	6	4	3	9051729	6	50	5	90	7	5	3
9051703	9	77.7	3	110	3	5	3	9051730	18	38.9	6	70	5	6	6
9051704	8	625	4	90	6	3	3	9051731	7	42.9	5	70	4	7	5
9051705	5	80	4	90	4	2	4	9051732	16	81.3	2	80	2	3	2
9051706	9	88.8	5	85	4	2	5	9051733	2	100	4	80	6	2	5
9051707	2	100	2	90	2	6	3	9051735	27	55.6	3	105	8	1	4
9051709	3	100	3	100	3	3	3	9051736	1	100	3	85	3	3	3
9051710	13	76.9	4	95	5	8		9051737	6	50	8	60	7	7	8
9051711	16	56.3	4	90	3	3	5	9051739	5	40	4	120	4	4	3
9051713	14	50	7	75	7	4	6	9051740	13	46.3	4	80	3	3	3
9051714	17	52.9	5	80	5	2	5	9051741	5	100	8	40	4	4	8
9051716	14	71.4	3	75	4	4	3	9051742	14	50	2	120	3	3	2
9051717	13	61.5	1	110	1	6	1	9051743	12	60	3	100	5	5	3
9051718	18	55.6	5	90	4	1	4	9051744	19	52.6	4	110	5	5	4
9051719	12	41.7	4	90	5	3	4	9051745	10	50	5	100	5	5	4
9051720	16	62.5	6	80	8	6	6	9051746	8	62.5	2	70	3	3	4
9051721	12	58.3	6	90	5	3	6	9051747	5	60	2	90	3	3	2
9051722	11	45.5	4	85	4	7	3	9051748	10	60	5	80	3	3	4
9051724	16	75	2	90	5	2	2	9051749	5	80	7	50	5	5	6
9051725	7	85.7	5	85	8	2	6	9051759	5	60	4	80	3	3	4
9051726	10	60	5	80	8	2	5	Control	17	64.7	1	110	1	1	1
9051727	6	83.3	5	80	4	3	5								

***Advanced Evaluations**:* Advanced evaluation plots were established at the PMCs in Beltsville, MD (2003), Alderson, WV (2003), and Cape May, NJ (2009). Plots in Maryland and West Virginia were observational, focusing on adaptability. Southampton Germplasm was successfully established and well adapted to the climate and soils at the PMCs in Maryland and West Virginia.

Southampton Germplasm was established at two locations at the Cape May PMC: 1) a constructed pit that was flooded during the growing season upon signs of water stress and 2) a traditional production field with no irrigation. The soil type of the pit is an Ingleside sandy loam and the field a Downer sandy loam. Limited quantitative data on vegetative growth and/or spread were collected; determinations were based on general qualitative observations. Plants in the flooded plot spread farther and more readily than those in the production plot. Additionally, the flooded plot produced a higher average number of planting units/foot than the traditional production plot. Survival at establishment was consistently high for both plots.

Multiple off center evaluation plots of Southampton Germplasm were established:

1. In June 2001, rhizomes were planted in a project with the US Army Corps of Engineers at Tioga-Hammond Dam, PA. This planting evaluated the use of native plants in riparian areas as a means of erosion control. Evaluations were done for nine years and Southampton Germplasm showed excellent performance with 100% cover and slow spread.

2. Southampton Germplasm was also used in a 2007-2008 trial investigating the ability of native species to compete with and prevent or minimize the spread of Japanese knotweed (*Polygonum cuspidatum).* This trial at Lamb's Creek in Mansfield, PA was a cooperative project involving the US Army Corps of Engineers, USDA NRCS and Agricultural Research

Service (ARS), Pennsylvania Department of Agriculture, Pennsylvania Department of Conservation and Natural Resources, Penn State College of Agricultural Sciences, and The Tioga County Conservation District. The study examined six species mixtures: a) 27 species commercial riparian buffer mixture; b) native cool season mixture including Virginia wildrye, autumn bentgrass, and fowl bluegrass; c) Virginia wildrye-bluejoint mixture; d) Virginia wildrye-prairie cordgrass mixture; e) High Tide Germplasm switchgrass; and f) 'Kanlow' switchgrass. The species mixtures were planted into plots that had received one and two seasons of mowing and herbicide treatments. After two years of evaluations, the Virginia wildrye-prairie cordgrass mixture was one of two mixtures able to compete and limit the spread of Japanese knotweed (Figures 1 and 2).

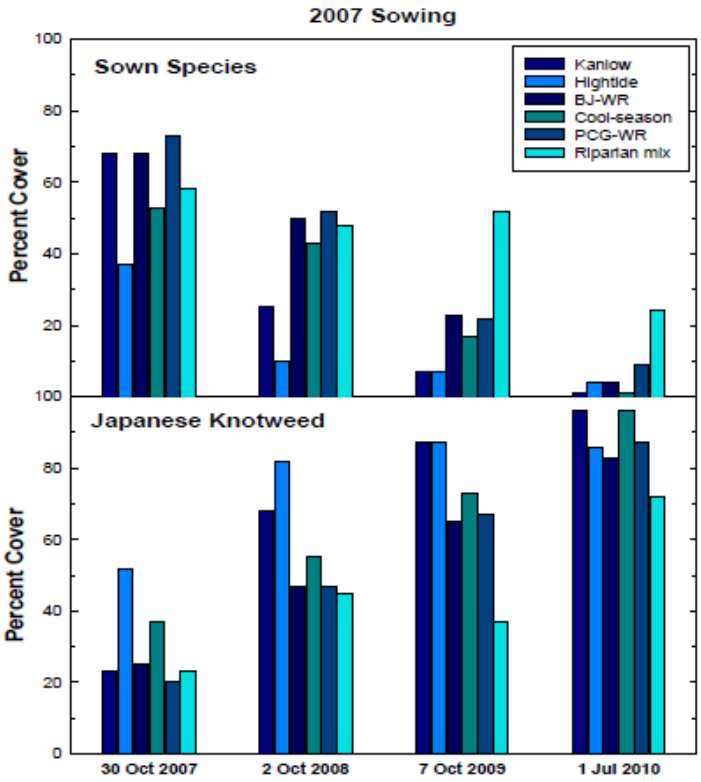

Figure 1. Trial of native species to control re-infestation by Japanese knotweed results after 1 year of treatment (2007).

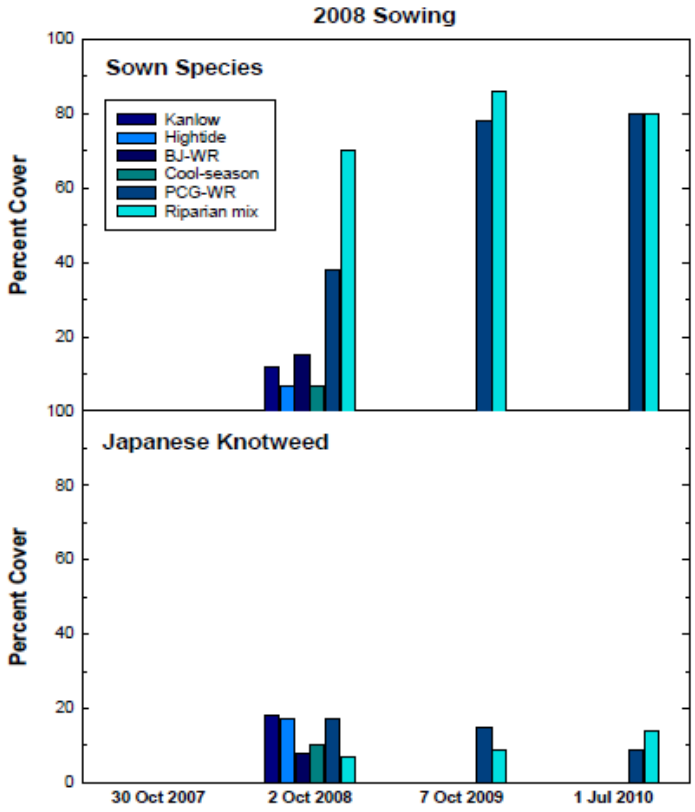

Figure 2. Trial of native species to control re-infestation by Japanese knotweed results after 2 years of treatment (2008).

3. A trial planting of Southampton Germplasm was installed under the Wetland Reserve Program at Canoga Creek in Seneca County, NY in 2007. This rhizome planting was well established after one growing season and follow up evaluations showed continued performance. The goals of this planting were for wildlife habitat improvement (by providing upland bird habitat and nesting cover) and erosion control through streambank stabilization.

4. Southampton Germplasm rhizomes were planted at a constructed island site in Whitney Point, NY in June 2009. This project was a partnership with the Army Corps of Engineers. At this site, Southhampton Germplasm was planted with common rush (*Juncus effuses*) to provide wildlife habitat and increase soil stability of the constructed island. Evaluations have been performed for three years at this site and have indicated excellent coverage (~100%) of prairie cordgrass with slow spread.

5. Evaluations were done in Illinois from 2011-2013 with a research assistant attending the College of Agricultural, Consumer and Environmental Sciences, University of Illinois. Southampton Germplasm was included in a trial with two other prairie cordgrass selections: accession 9046805 (Maine) and IL-102 (Illinois). The focus of this evaluation was the application of prairie cordgrass for forage. Growth rate of the three selections was examined for each growing season. Southampton Germplasm consistently achieved a greater growth rate than the selection from Maine for the 3 years of observation (Figures 3 to 5.). The yield components dry weight per plant, tillers per plant, heading, leaf count, height, and grams per tiller were evaluated during the 2011-2012 growing season (Tables 3 and 4). Southampton Germplasm produced a greater dry weight for both years than accession 9046805. The number of tillers produced per plant varied with Southampton Germplasm producing more in

2011 and 9046805 producing more in 2012. The tiller production by Southampton Germplasm was consistently greater than 9046805. Southampton Germplasm did not perform as well as IL-102, possibly IL-102 was better adapted to the environment of the planting area.

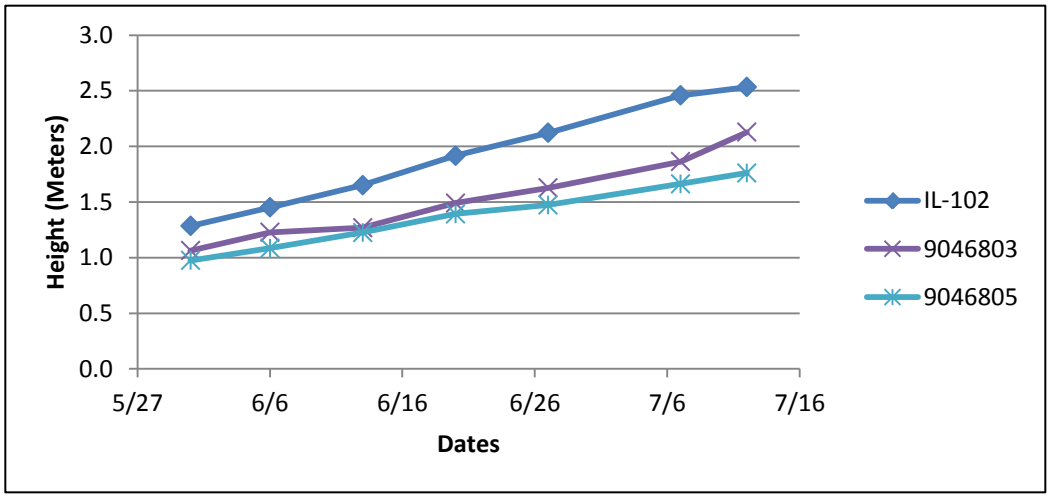

Figure 3. 2011 Growth rate comparison of prairie cordgrass selections evaluated at EBI Energy Farm, in Urbana, Illinois.

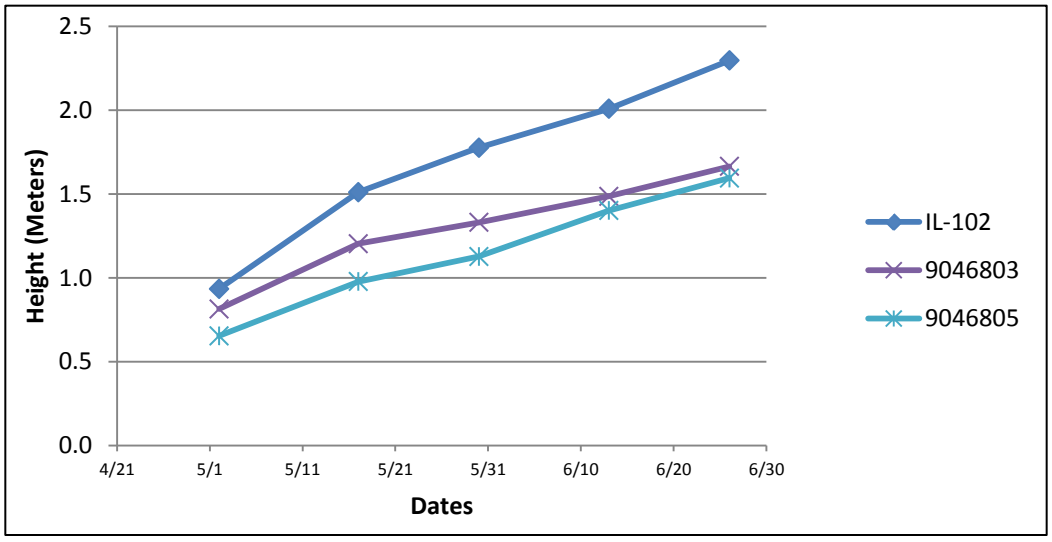

Figure 4. 2012 Growth rate comparison of prairie cordgrass selections evaluated at EBI Energy Farm in Urbana, Illinois.

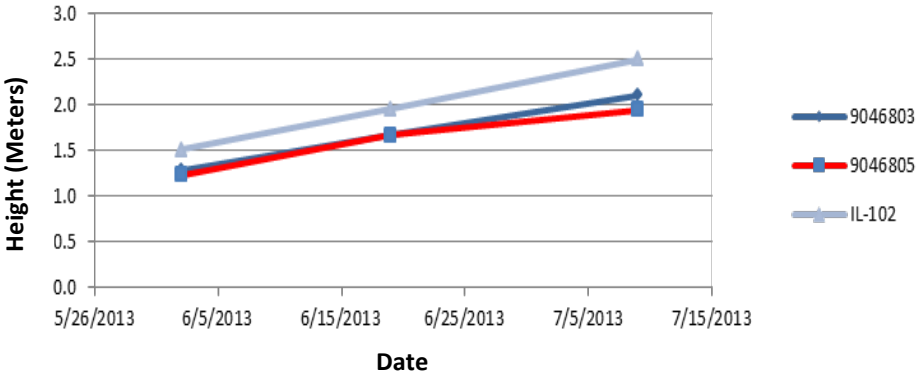

Figure 5. 2013 Growth rates comparison of prairie cordgrass selections evaluated at EBI Energy Farm in Urbana, Illinois

Table 3. Yield component comparison of prairie cordgrass selections evaluated 2011, Illinois.

	dry wt. (g)/plant	tillers/plant	heading	leaf No.	height(in)	g/tiller
IL-102	817.7	53.9	192.6	9.5	102.3	15.9
9046803	432.1	50.2	176.6	8.5	79.9	8.6
9046805	226.2	42.6	162.4	6.8	69.4	5.8

Table 4. Yield Component Comparison of prairie cordgrass Selections Evaluated 2012, Illinois

	dry wt. (g)/plant	tillers/plant	heading	leaf No.	height(in)	g/tiller
IL-102	786.8	107.9	200.3	9.5	93.3	7.6
9046803	538.4	77.5	193.4	9	62.7	7
9046805	389.5	113.6	179.3	7	63.8	3.6

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by NRCS (USDA NRCS, 2000), and the best available information for this species. Results of this evaluation determined that Southampton Germplasm prairie cordgrass was suitable for release based on the criterion contained in this document. This conclusion is mainly due to the fact that prairie cordgrass is a naturally occurring species already present throughout the continental United States and Canada and planting it would therefore not constitute an introduction of an exotic species into local ecosystems. It is a documented host of rust diseases (*Puccinia* spp.) but infections have not necessitated treatment for successful seed or vegetative production. Any negative impacts on other native plant species would likely be minimal to non-existent. Control of prairie cordgrass can be achieved by chemical means if necessary. Also, release of this species will make available an additional native species for wetland restoration, streambank stabilization, and will provide a good food source and habitat for wildlife. It will also provide a native species that competes with nonnative, exotic species in similar ecosystems.

Conservation Use: Southampton Germplasm is recommended for erosion control applications. Erosion on drainage channels, spillways, and streambanks can be prevented or minimized by a healthy stand of prairie cordgrass. Other potential uses are critical area treatment on hydric soils, wetland revegetation, and shoreline stabilization. While prairie cordgrass is often found in fresh water environments, it also has potential for applications in brackish environments. Additionally, prairie cordgrass competes with several nonnative, invasive species that occur in similar habitats.

Prairie cordgrass also provides potential wildlife benefits. Prairie cordgrass stands provide nesting area for the marsh wren and habitat for the muskrat. Furthermore, the rootstocks, seed, and plants provide a food source for waterfowl, marshbirds, shorebirds, songbirds, and deer.

Prairie cordgrass has biomass production and perennial hayage production applications. These applications may have the most benefit on marginal agricultural lands and salt affected soils. Ideal lands are seasonally waterlogged soils and areas where salt water intrusion is affecting traditional production.

Area of Adaptation: Southampton Germplasm prairie cordgrass is native to and occurs in natural areas throughout most of the continental United States and Canada. Areas of suggested and potential use for Southampton Germplasm are the coastal regions of Southern New England to the Mid-Atlantic area.

Availability of Plant Materials: Vegetative cuttings and a limited amount of G1 foundation seed are available from the USDA-NRCS Cape May Plant Materials Center, Cape May Court House, New Jersey. Nurseries may establish their own plants for long term production.

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Southampton Germplasm prairie cordgrass (*Spartina pectinata* Bosc ex Link.)

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