UF IFAS UNIVERSITY of FLORIDA

Assessment of Non-native Plants in Florida's Natural Areas

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Assessment date17 Sept 2015

	***Sesamum indicum* All Zones**	**Answer**	**Score**
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high) North Zone: suited to Zones 8, 9 Central Zone: suited to Zones 9, 10 South Zone: suited to Zone 10	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in habitats with periodic inundation North Zone: mean annual precipitation 50-70 inches Central Zone: mean annual precipitation 40-60 inches South Zone: mean annual precipitation 40-60 inches	unk	0
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	2
3.02	Garden/amenity/disturbance weed	y	2
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	n	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals	n	-1
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens	y	1
4.07	Causes allergies or is otherwise toxic to humans	y	1
4.08	Creates a fire hazard in natural ecosystems	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.10	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils). North & Central Zones: infertile soils; South Zone: shallow limerock or Histisols.	unk	0
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1

6.03	Hybridizes naturally	unk	-1
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative propagation	n	-1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	unk	-1
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	unk	-1
7.04	Propagules adapted to wind dispersal		
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production	n	-1
8.02	Evidence that a persistent propagule bank is formed (>1 yr)	n	-1
8.03	Well controlled by herbicides	unk	1
8.04	Tolerates, or benefits from, mutilation or cultivation	n	-1
8.05		?	
	Total Score	**3**	
	Implemented Pacific Second Screening	**yes**	
	Risk Assessment Results	**Evaluate**	

section	**# questions answered**		**satisfy minimum?**
A		10	yes
B		11	yes
C		15	yes
total		36	yes

	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01	1. PERAL NAPPFAST Global Plant Hardiness (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif). 2. GBIF http://www.gbif.org/species/3172622 accessed 9/16/2015 3. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?409896 (9-4-2015). Encyclopedia of Life http://eol.org/pages/484896/overview (9-4-2015)	No computer analysis was performed. 1.&2. Global hardiness zone: 7-12 2. Although it has often been asserted that this species was domesticated in Africa and only later brought to India and elsewhere (e.g., Vaughan and Geissler 1997), Bedigian (2003, 2010 and references therein) and Fuller (2003 and references therein) argue that in fact it was more likely domesticated in South Asia.
2.02		
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf).	1. Distribution in the native/cultivated range occurs in more than three types including Csb, Am, Aw, Af, Cfa
2.04	1. Climate Charts. World Climate Maps. http://www.climate-charts.com/World-Climate-Maps.html#rain (8-19-2015) 2. Mkamilo, G.S. & Bedigian, D., 2007. Sesamum indicum L. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <http://www.prota4u.org/search.asp>. Accessed 14 September 2015.	1. Based on this plant's native range, it will likely require cultivation and controlled irrigation to prosper in all three zones. 2. minimum rainfall of 20 to 26 in. per season is necessary for reasonable yields.
2.05	1. ANDRADE, Patrícia Barreto de et al. Floral biology and pollination requirements of sesame (Sesamum indicum L.). Acta Sci., Anim. Sci. [online]. 2014, vol.36, n.1 [cited 2015-09-07], pp. 93-99 . Available from: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1807-86722014000100013&lng=en&nrm=iso>. ISSN 1807-8672. http://dx.doi.org/10.4025/actascianimsci.v36i1.21838. 2. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ. 3. Mkamilo, G.S. & Bedigian, D., 2007. Sesamum indicum L. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <http://www.prota4u.org/search.asp>. Accessed 11 September 2015.	1. Sesame was introduced in Brazil by the Portuguese in the XVI century from their Indian colonies 2. Introduced to the United States through the slave trade. 3. This species has been introduced across the tropics.
3.01	1. http://www.hear.org/gcw/species/sesamum_indicum/HEAR (9-4-2015) 2.http://www.hear.org/pier/species/sesamum_indicum.htm (9-4-2015)	1. In Fiji, "cultivated and occasionally naturalized, becoming a weed in canefields, and in moist, cultivated areas near sea level" (Smith, 1991; p. 139). Also listed as invasive in the Philippines 2. listed as "agricultural weed, casual alien, naturalised, weed " from various sources. Naturalized in Canada, New South Wales, Swaziland, Mexico

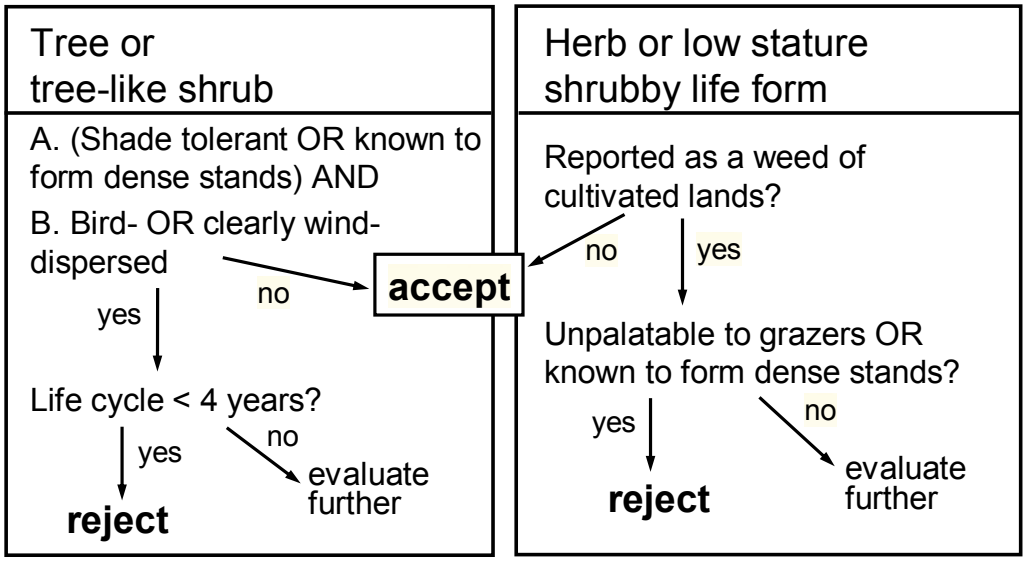
3.02	1. HEAR http://www.hear.org/pier/species/sesamum_indicum.htm (9-4-2015) 2. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ.	1. In Fiji, "cultivated and occasionally naturalized, becoming a weed in canefields, and in moist, cultivated areas near sea level" (Smith, 1991; p. 139). 2. This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed.
3.03	1. http://www.hear.org/gcw/species/sesamum_indicum/HEAR (9-4-2015)	1. Agricultural weed in South Africa, New South Wales
3.04		no evidence
3.05		no evidence
4.01	Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200021445 (9-11-2015)	No evidence of these features
4.02	Allelopathic effects of sesame (Sesamum indicum L.) on some field crops [1991] http://agris.fao.org/agris-search/search.do?recordID=TH2000002520 (9-11-2015)	No pronounced allelopathic effects were found.
4.03		no evidence
4.04		no evidence
4.05		no evidence
4.06	1. Purdue University https://www.hort.purdue.edu/newcrop/afcm/sesame.html (9-4-2015) 2. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ. 3. CABI http://www.cabi.org/isc/datasheet/49489 (accessed 9-4-2015)	1. The most common sesame diseases are leaf spot, leaf and stem blights, Fusarium wilt, charcoal rot and root rot. Some of the disease organisms are carried on the seed. It is advisable to use disease-free seed and treat it with a fungicide before planting... Sesame plants are often attacked and damaged by aphids. Thrips will stunt seedlings and injure developing flower buds so that capsules do not set. The gall midge (Asphondylia sesami Felt.) and various caterpillars have been important in some countries. Green stink bugs, red spiders, grasshoppers, cut.worms, armyworms and bollworms also attack sesame, but do not cause extensive damage. 2. Pest threats or potential damage are minimal. Under cool, wet conditions, soil pathogens can kill seedlings 3. Major host of: Acherontia lachesis (death's head hawkmoth); Acherontia styx (small death's head hawkmoth); Agrotis ipsilon (black cutworm); Agrotis segetum (turnip moth); Alocypha bimaculata (simsim flea beetle); Amsacta moorei (tiger moth); Antigastra catalaunalis (sesame webworm); Asphondylia sesami (simsim gall midge); Cadra cautella (dried currant moth); Callosobruchus analis (weevil, bean); Celosia argentea (celosia); Choanephora cucurbitarum (Choanephora fruit rot); Cowpea aphid-borne mosaic virus; Cylindrosporium sesami (angular leaf spot of sesame); Diabolocatantops axillaris (devil grasshopper); Digitaria ciliaris (southern crabgrass); Eleusine indica (goose grass); Emex spinosa (spiny emex); Erinnyis ello (cassava hornworm (USA)); Eysarcoris guttiger (two spotted sesame bug); Helicoverpa fletcheri; Heliotropium europaeum (common heliotrope); Heliotropium indicum (Indian heliotrope); Heterodera cajani (pigeon pea cyst nematode); Ipomoea triloba (three-lobe morning glory);
4.07	WebMD http://www.webmd.com/allergies/news/20090316/sesame-allergies-on-the-rise-in-us (9-11-2015) 2. Anaplyaxis http://www.anaphylaxis.org.uk/what-is-anaphylaxis/knowledgebase/sesame-allergy-factsheet?page=10 (9-11-2015)	1. Sesame Allergies on the Rise in U.S. 2.Sesame allergy is fairly common in some countries, including Australia and Israel, and it would appear to be on the increase in the UK.

4.08		no evidence
4.09	1. Dave's Garden http://davesgarden.com/guides/pf/go/81666/#b (9-4-2015) 2. Plants for a Future http://www.pfaf.org/user/Plant.aspx?LatinName=Sesamum+indicum (9-11-2015)	1. requires full sun 2. It cannot grow in the shade.
4.10	1. Purdue University https://www.hort.purdue.edu/newcrop/afcm/sesame.html (9-4-2015) 2. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ.	1. Sesame is adaptable to many soil types, but it thrives best on well-drained, fertile soils of medium texture and neutral pH. Sesame, which has an extensively branched feeder root system, appears to improve soil structure. Sesame has a very low salt tolerance and cannot tolerate wet conditions. 2. Sesame grows best in well-drained, sandy loam soils,
4.11		no evidence
4.12		Herbaceous
5.01		Family: Pedaliaceae
5.02		Family: Pedaliaceae
5.03		Herbaceous
5.04	Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200021445 (9-11-2015)	No evidence of these structures
6.01		no evidence
6.02	1. HEAR http://www.hear.org/pier/species/sesamum_indicum.htm (9-4-2015) 2. Dave's Garden http://davesgarden.com/guides/pf/go/81666/#b (9-4-2015) 3. Mkamilo, G.S. & Bedigian, D., 2007. Sesamum indicum L. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <http://www.prota4u.org/search.asp>. Accessed 11 September 2015.	1. Propagated by seed. 2. Propagated from seed 3. Sesame is propagated from seed
6.03		no evidence
6.04	1. ANDRADE, Patrícia Barreto de et al. Floral biology and pollination requirements of sesame (Sesamum indicum L.). Acta Sci., Anim. Sci. [online]. 2014, vol.36, n.1 [cited 2015-09-07], pp. 93-99 . Available from: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1807-86722014000100013&lng=en&nrm=iso>. ISSN 1807-8672. http://dx.doi.org/10.4025/actascianimsci.v36i1.21838. 2. Cercetari Agronomice in Moldova. Pollinators Visiting Sesame (Sesamum Indicum L.) Seed Crop with Reference to Foraging Activity of Some Bee Species. Volume 45, Issue 2, Pages 49–55, ISSN (Online) 2067-1865, ISSN (Print) 0379-5837, DOI: 10.2478/v10298-012-0014-9, July 2012 3. Plants for a Future http://www.pfaf.org/user/Plant.aspx?LatinName=Sesamum+indicum (9-11-2015) 4. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ.	1. Sesame is a mixed pollination plant, able to selfpollinate and reach levels above 50% fruit set, but with potential for significant increase in fruit production in the presence of biotic pollinators that promote cross-pollination. 2. Sesame is self-pollinating, although differing rates of cross pollination have been reported 3. The flowers are hermaphrodite (have both male and female organs) 4. The flowers are both male and female and will self-pollinate.

6.05	1. Maysa Said, Soliman Mohamed Kamel, Abdelfatah Blal Hatem Mahfouz. 2013. Impact of Insect Pollinators on Sesame. LAP Lambert Academic Publishing 2. Cercetari Agronomice in Moldova. Pollinators Visiting Sesame (Sesamum Indicum L.) Seed Crop with Reference to Foraging Activity of Some Bee Species. Volume 45, Issue 2, Pages 49–55, ISSN (Online) 2067-1865, ISSN (Print) 0379-5837, DOI: 10.2478/v10298-012-0014-9, July 2012	1. Of the total pollination activities, over 80% is performed by insects and bees contribute nearly 80% of the total insect pollination, and therefore, they are considered the best pollinators. 2. Investigations carried out on the major insect orders visiting sesame during flowering period from July 15 to September 4, 2011. Figure 1 revealed that four groups of pollinators visited the sesame belonging to order Hymenoptera, Diptera, Lepidoptera and Coleoptera of class insecta during the flowering period.
6.06		no evidence
6.07	1. Phenology of Sesame D. Ray Langham Issues in new crops and new uses. 2007. J. Janick and A. Whipkey (eds.). ASHS Press, Alexandria, VA. 2. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ. 3. Day J S. (2000) Development and maturation of sesame seeds and capsules. Field Crop Research 67: 1-9	1. In Australia these ranges would be vegetative 28–37 days, reproductive 35, ripening 20, and drying 40 (M. Bennett, pers. commun.). Often the cycles are shorter in the tropics. 2. Approximately 120–150 days after planting (DAP) (Langham et al., 2008) or by October, sesame will have dropped its leaves and dried for seed harvesting... Flowering starts approximately 35–45 DAP 3. "Maximum seed dry weights were reached about 35 days after seeds began developing. Maximum germination rates were reached when seeds were 35±53 days old. Changes in seed appearance clearly signalled that mass maturity and germination maturity had been reached. Capsule senescence commenced more than 53 days after capsules began developing. "
7.01		no evidence
7.02	Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ. 2. Mkamilo, G.S. & Bedigian, D., 2007. Sesamum indicum L. [Internet] Record from PROTA4U. van der Vossen, H.A.M. & Mkamilo, G.S. (Editors). PROTA (Plant Resources of Tropical Africa / Ressources végétales de l'Afrique tropicale), Wageningen, Netherlands. <http://www.prota4u.org/search.asp>. Accessed 14 September 2015.	1. Sesame is most commonly planted in the south and southwestern United States, but is also being promoted in the southeast because it grows well in hot weather and sandy soils. 2. Although native to Old World, sesame is now grown across the tropics.
7.03		no evidence
7.04		no evidence
7.05		no evidence
7.06	1. Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ.	1. Sesame seed is eaten by songbirds, quail, and doves.
7.07	Flora of China http://www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200021445 (9-11-2015)	no evidence of mechanisms for attachment
7.08		no evidence
8.01	Sheahan, C.M. 2014. Plant guide for sesame (Sesamum orientale). USDA-Natural Resources Conservation Service, Cape May Plant Materials Center, Cape May, NJ.	1. The flowers are both male and female and will self-pollinate. The seed is produced in a 1–1.5 in (2.5–3.8 cm) long, divided seed capsule that opens when the seeds are mature… There are approximately 70 seeds per capsule.
8.02		no evidence
8.03		no evidence of control
8.04		no evidence
8.05		no evidence

Pacific second screening: decision rules for species with WRA scores between 1 and 6

(from Daehler *et al*. 2004)



Vines must pass both tests