Taxon: Senna italica Mill.

Family: Fabaceae

Common Name(s): dog senna
Italian senna
Port Royal senna
Senegal senna
Spanish senna

Synonym(s): Cassia italica (Mill.) Spreng.
Cassia obovata Collad.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 26 Nov 2021

WRA Score: 11.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Herb/Shrub, Naturalized Elsewhere, Disturbance Weed, Animal Dispersed, Water Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		

Qsn #	Question	Answer Option	Answer
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Selection and breeding of Senna italica have not been attempted, but in view of the wide variation would be worthwhile if commercial production is envisaged."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	NA

201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**High**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is a native of many African countries from Cape Verde east to Somalia and south to South Africa. In Benin it is only recorded as a cultivated plant. It is also native in Asia, from the Middle East through Iraq, Iran, Pakistan and India to Sri Lanka, and has been introduced and is naturalized in the Caribbean and Venezuela."

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is a native of many African countries from Cape Verde east to Somalia and south to South Africa. In Benin it is only recorded as a cultivated plant. It is also native in Asia, from the Middle East through Iraq, Iran, Pakistan and India to Sri Lanka, and has been introduced and is naturalized in the Caribbean and Venezuela."

Qsn #	Question	Answer
203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica is a perennial herb with the capability to grow and thrive in a wide range of climates and soil types, including arid and semiarid areas subject to remarkable levels of water stress, and in moist habitats in tropical and subtropical regions."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Elevation rang >1000 m] "Senna italica is found in grassland of the drier regions of tropical Africa, from sea-level up to 1850 m altitude. It is often found close to streams and in disturbed habitats such as roadsides and waste places. "

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 23 Nov 2021]	"Native Africa MACARONESIA: Cabo Verde NORTHERN AFRICA: Egypt, Western Sahara, Libya (s.) NORTHEAST TROPICAL AFRICA: Djibouti, Ethiopia, Sudan, Somalia, Chad EAST TROPICAL AFRICA: Kenya, Tanzania, Uganda WEST-CENTRAL TROPICAL AFRICA: Cameroon WEST TROPICAL AFRICA: Gambia, Mali, Niger, Nigeria, Senegal SOUTH TROPICAL AFRICA: Angola, Mozambique, Zimbabwe SOUTHERN AFRICA: Botswana, Namibia, Eswatini, South Africa Asia-Temperate ARABIAN PENINSULA: United Arab Emirates, Bahrain, Oman, Qatar, Saudi Arabia, Yemen WESTERN ASIA: Egypt [Sinai], Iran (s.), Iraq, Israel, Jordan Asia-Tropical INDIAN SUBCONTINENT: India [Andhra Pradesh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Karnataka, Delhi, Daman and Diu], Sri Lanka, Pakistan Naturalized Southern America NORTHERN SOUTH AMERICA: Venezuela (n.)"
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is a native of many African countries from Cape Verde east to Somalia and south to South Africa. In Benin it is only recorded as a cultivated plant. It is also native in Asia, from the Middle East through Iraq, Iran, Pakistan and India to Sri Lanka, and has been introduced and is naturalized in the Caribbean and Venezuela."
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence in the Hawaiian Islands as of 2019

205	**Does the species have a history of repeated introductions outside its natural range?**	**y**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is a native of many African countries from Cape Verde east to Somalia and south to South Africa. In Benin it is only recorded as a cultivated plant. It is also native in Asia, from the Middle East through Iraq, Iran, Pakistan and India to Sri Lanka, and has been introduced and is naturalized in the Caribbean and Venezuela. "

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Romeiras, M. M., Catarino, L., Torrão, M. M., & Duarte, M. C. (2011). Diversity and origin of medicinal exotic flora in Cape Verde Islands. Plant Ecology and Evolution, 144(2): 214-225	"Table 1 – Checklist of the exotic naturalized medicinal plants of Cape Verde Islands. (a), the taxa in which the introduced status in Cape Verde is somewhat doubtful are marked with an asterisk (*)," [*Senna italica - questionably introduced. Other sources list it as native]
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Caribbean and Venezuela] "Senna italica is a native of many African countries from Cape Verde east to Somalia and south to South Africa. In Benin it is only recorded as a cultivated plant. It is also native in Asia, from the Middle East through Iraq, Iran, Pakistan and India to Sri Lanka, and has been introduced and is naturalized in the Caribbean and Venezuela."
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence in the Hawaiian Islands as of 2019

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"It is currently listed as invasive on several islands across the Caribbean region including Aruba, Curacao, Bonaire, Saba, St. Martin and Anguilla. On these islands, S. italica is regarded as a common weed of pastures, disturbed areas, waterways and wastelands, where it alters natural successional processes and displaces native ruderal species."

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**
	Al-Rowaily, S. L., El-Bana, M. I., Al-Bakre, D. A., Assaeed, A. M., Hegazy, A. K., & Ali, M. B. (2015). Effects of open grazing and livestock exclusion on floristic composition and diversity in natural ecosystem of Western Saudi Arabia. Saudi Journal of Biological Sciences 22(4), 430-437	[Identified as weedy and unpalatable in pastures] "The dominant weedy species in the grazed site were C. procera, C. colocynthis, P. tomentosa, S. italica and S. incanum which are all widespread unpalatable species (Chaudhary and Le Houe´rou, 2006; Gallacher and Hill, 2006). It seems that these species have replaced the highly palatable grasses and intolerant grazing species as a result of heavy grazing (Briske, 1991; Gallacher and Hill, 2006; Al-Rowaily et al., 2012)."

Qsn #	Question	Answer
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Impact on pasture productivity unknown] "Senna italica is listed as invasive in Aruba, Curacao, Bonaire, Saba, St. Martin and Anguilla. It is regarded as a common weed of pastures, disturbed areas, waterways and wastelands that alters natural successional processes and displaces native ruderal species (Connor, 2008; van der Burg et al., 2012; Smith et al., 2014)."

304	Environmental weed	
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[Possibly. Reported to displace native ruderal species] "Senna italica is listed as invasive in Aruba, Curacao, Bonaire, Saba, St. Martin and Anguilla. It is regarded as a common weed of pastures, disturbed areas, waterways and wastelands that alters natural successional processes and displaces native ruderal species (Connor, 2008; van der Burg et al., 2012; Smith et al., 2014)."

305	Congeneric weed	y
	Source(s)	**Notes**
	Weber, E. (2017). Invasive Plant Species of the World, 2nd Edition: A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	"Senna alata ...Where invasive it forms dense thickets, shading out all other plants and preventing any regeneration of native species. The shrub establishes quickly in disturbed sites. Heavy infestations may restrict access to water for livestock and wildlife (Parsons and Cuthbertson, 2001)." ... "Senna didymobotrya ... Christmas bush forms extensive and dense thickets climbing over native vegetation, impeding growth and regeneration of native species. The shrub grows abundantly along rivers and in savannas. Extensive thickets affect wildlife by reducing habitats and restricting access to water (Macdonald, 1983; Henderson, 2001). Little is known about the ecology of this plant as an invader."
	Wakibara, J. V., & Mnaya, B. J. (2002). Possible control of Senna spectabilis (Caesalpiniaceae), an invasive tree in Mahale mountains National Park, Tanzania. Oryx, 36(4), 357-363	"Senna spectabilis is a tree native to South and Central America. Thirty-five years ago it invaded the Mahale Mountains National Park in western Tanzania where it presently covers c. 225 ha. We quantified its occurrence relative to that of sympatric species of native trees, and compared girdling and felling as methods for its control in three 0.25 ha plots. Within invaded areas of forest this exotic species was both the most abundant and dominant of the 26 species of tree recorded. During 4 years of monitoring the experimental plots the abundance of S. spectabilis declined markedly in the plots where control methods were practised, but increased slightly in the unmanipulated plot. In contrast, the abundance of native tree species increased markedly in the plots where S. spectabilis had been removed or killed, with higher densities in the girdled rather than the felled plot. S. spectabilis appears to suppress the recruitment of native trees in the Park, and its removal can encourage regeneration of the degraded forest without the need for artificial seeding."
	Weber, E. (2003). Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	Senna alata, S. bicapsularis, S. didymobotrya, S. obtusifolia [listed as significant weeds of natural areas]

Qsn #	Question	Answer
401	**Produces spines, thorns or burrs**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[No evidence] "Deciduous, perennial herb or small shrub up to 60 cm tall, often with prostrate stems. Leaves arranged spirally, paripinnately compound with 4–6 pairs of leaflets; stipules narrowly triangular to ovate-triangular, 3–9 mm long, early deflexed, somewhat persistent; petiole 1.5–2.5 cm long; leaflets oblong-obovate or narrowly elliptical to elliptical, 1–6.5 cm × 0.5–1.5 cm, base cuneate, unequal, apex rounded to obtuse, shortly hairy on both sides. Inflorescence an erect, axillary raceme 2–25 cm long, up to 20-flowered; bracts rhombic to ovate, shortly pointed, up to 5 mm long. Flowers bisexual, zygomorphic, 5-merous; sepals unequal, oblong-elliptical, up to 1 cm long, obtuse at apex; petals obovate, up to 13 mm long, yellow; stamens 10, the 2 lower ones largest, 5 medium-sized, 3 short and sterile; ovary superior, with short, stiff hairs, style up to 6 mm long. Fruit a flattened, oblong pod 2.5–6 cm × 1.5–2 cm, with a ridge running along the middle of each valve, tip upcurved, dehiscent by 2 valves, many-seeded. Seeds oblong-ovate, compressed, 6–7.5 mm × 1.5–2.5 mm, with a small areole on each face."

402	**Allelopathic**	
	Source(s)	**Notes**
	Sadaqa, E. A., Bawazir, A. A., & Qasem, J. R. (2010). Allelopathic activity of some common weeds species in onion fields. Allelopathy Journal, 26(2): 175-184	[Root exudates demonstrate allelopathic effects] "The root exudates of A. graecizans were most inhibitory to onion seed germination, C. italica root exudates drastically inhibited the plant height and shoot dry weight and E. colonum exudates decreased the onion root length and dry weight. Although none of the weeds foliage leachates was harmful to onion seed germination but leachates reduced the onion height and shoot and root dry weights."

403	**Parasitic**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Deciduous, perennial herb or small shrub up to 60 cm tall, often with prostrate stems." [Fabaceae. No evidence]

404	**Unpalatable to grazing animals**	
	Source(s)	**Notes**
	Al-Rowaily, S. L., El-Bana, M. I., Al-Bakre, D. A., Assaeed, A. M., Hegazy, A. K., & Ali, M. B. (2015). Effects of open grazing and livestock exclusion on floristic composition and diversity in natural ecosystem of Western Saudi Arabia. Saudi Journal of Biological Sciences 22(4), 430-437	[Identified as weedy and unpalatable in pastures] "The dominant weedy species in the grazed site were C. procera, C. colocynthis, P. tomentosa, S. italica and S. incanum which are all widespread unpalatable species (Chaudhary and Le Houe´rou, 2006; Gallacher and Hill, 2006). It seems that these species have replaced the highly palatable grasses and intolerant grazing species as a result of heavy grazing (Briske, 1991; Gallacher and Hill, 2006; Al-Rowaily et al., 2012)."

Qsn #	Question	Answer
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Possibly] "Reports on the value of Senna italica as a browse are contradictory. In East Africa it seems to be eaten by most livestock, whereas in West Africa livestock seems to avoid it."

405	Toxic to animals	
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2021). Senna italica. https://tropical.theferns.info/viewtropical.php?id=Senna+italica. [Accessed 26 Nov 2021]	"Known Hazards None known"
	IUCN Centre for Mediterranean Cooperation. (2005). A Guide to Medicinal Plants in North Africa. IUCN, Malaga, Spain	"Senna is apparently not used as a medicine today in the nearby Eastern Province of Saudia Arabia, where some Bedouins regard it as toxic to livestock. However, the seeds are eaten by Bedouins in Central Saudi Arabia, who say they are good for the stomach and as a purgative. A decoction of the crushed seeds is used as a laxative in the United Arab Emirates."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Toxicity tests on goats and rabbits fed with foliage proved negative. Rats and chicks fed with seeds at 10% of their intake showed symptoms of toxicity, but did not die during the 6-week test period. Feeding chicks with seeds at 2% of their intake promoted growth. The seeds yield a water soluble gum (about 20% of dry matter), mainly composed of D-galactose and D-mannose."
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Toxicity to animals not specified] "Toxic. Leaves wound healing, a dressing for burns and ulcers. Leaves, pods and mature seeds used as a purgative and abortifacient; mature seeds have a purging activity; decoction or maceration for stomach complaints, fever, jaundice, venereal diseases and against intestinal worms. Flowers tea a purgative and to induce labor. Roots for indigestion, sore eyes, stomachache, influenza, liver complaints, gall bladder disorders, nausea, vomiting, wounds, diarrhea. Veterinary medicine, whole plant ground with leaves of Calotropis gigantea and given orally in anthrax; leaves of Cassia italica with flower of Calotropis gigantea and fruit of Terminalia chebula pounded and given orally in constipation; leaves of Jasminum auriculatum along with those of Cassia italica and roots of Hemidesmus indicus pounded and the extract given orally for tympany."
	WRA Specialist. (2021). Personal Communication	Possibly. There are conflicting reports on toxicity and palatability to animals

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is a host of the root lesion nematode (Pratylenchus penetrans). In perennial cultivation serious attacks by termites have been observed."

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	**Notes**

Qsn #	Question	Answer
	IUCN Centre for Mediterranean Cooperation. (2005). A Guide to Medicinal Plants in North Africa. IUCN, Malaga, Spain	"Senna italica is a plant of Arabian origin. The plant is widely acknowledged in Bahrain as medicinal; as an infusion, its pods and leaves are used as a purgative. Senna is apparently not used as a medicine today in the nearby Eastern Province of Saudia Arabia, where some Bedouins regard it as toxic to livestock. However, the seeds are eaten by Bedouins in Central Saudi Arabia, who say they are good for the stomach and as a purgative."
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Possibly. Toxic and medicinal properties] "Toxic. Leaves wound healing, a dressing for burns and ulcers. Leaves, pods and mature seeds used as a purgative and abortifacient; mature seeds have a purging activity; decoction or maceration for stomach complaints, fever, jaundice, venereal diseases and against intestinal worms. Flowers tea a purgative and to induce labor. Roots for indigestion, sore eyes, stomachache, influenza, liver complaints, gall bladder disorders, nausea, vomiting, wounds, diarrhea. Veterinary medicine, whole plant ground with leaves of Calotropis gigantea and given orally in anthrax; leaves of Cassia italica with flower of Calotropis gigantea and fruit of Terminalia chebula pounded and given orally in constipation; leaves of Jasminum auriculatum along with those of Cassia italica and roots of Hemidesmus indicus pounded and the extract given orally for tympany."
	WRA Specialist. (2021). Personal Communication	Possibly. There are conflicting reports on toxicity and palatability to animals

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[No evidence. Not listed among impacts] "Senna italica is listed as invasive in Aruba, Curacao, Bonaire, Saba, St. Martin and Anguilla. It is regarded as a common weed of pastures, disturbed areas, waterways and wastelands that alters natural successional processes and displaces native ruderal species (Connor, 2008; van der Burg et al., 2012; Smith et al., 2014)."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Occurs in dry areas, but no evidence of increased fire risk where it occurs] "Senna italica is found in grassland of the drier regions of tropical Africa, from sea-level up to 1850 m altitude. It is often found close to streams and in disturbed habitats such as roadsides and waste places."

Qsn #	Question	Answer
409	**Is a shade tolerant plant at some stage of its life cycle**	
	Source(s)	**Notes**
	Grow Plants. (2021). Senna italica. https://www.growplants.org/growing/senna-italica. [Accessed 26 Nov 2021]	"Full Sun / Half Shade"
	Tropical Plants Database, Ken Fern. (2021). Senna italica. https://tropical.theferns.info/viewtropical.php?id=Senna+italica. [Accessed 26 Nov 2021]	"Prefers a deep, well-drained, moderately fertile sandy loam and a position in full sun"
	Wild Flower Nursery. (2021). Senna italica. https://wildflowernursery.co.za/indigenous-plant-database/senna-italica/. [Accessed 26 Nov 2021]	"Senna italica is a small and floriferous little shrub that does well in full sun."

410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y**
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica is a perennial herb with the capability to grow and thrive in a wide range of climates and soil types, including arid and semiarid areas subject to remarkable levels of water stress, and in moist habitats in tropical and subtropical regions."

411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Deciduous, perennial herb or small shrub up to 60 cm tall, often with prostrate stems."

412	**Forms dense thickets**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is found in grassland of the drier regions of tropical Africa, from sea-level up to 1850 m altitude. It is often found close to streams and in disturbed habitats such as roadsides and waste places." [No evidence]
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[No evidence] "Senna italica is a perennial herb with the capability to grow and thrive in a wide range of climates and soil types, including arid and semiarid areas subject to remarkable levels of water stress, and in moist habitats in tropical and subtropical regions. It is currently listed as invasive on several islands across the Caribbean region including Aruba, Curacao, Bonaire, Saba, St. Martin and Anguilla. On these islands, S. italica is regarded as a common weed of pastures, disturbed areas, waterways and wastelands, where it alters natural successional processes and displaces native ruderal species."

501	**Aquatic**	**n**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Terrestrial] "Senna italica is found in grassland of the drier regions of tropical Africa, from sea-level up to 1850 m altitude. It is often found close to streams and in disturbed habitats such as roadsides and waste places. "

502	Grass	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 23 Nov 2021]	Family: Fabaceae (alt. Leguminosae) Subfamily: Caesalpinioideae Tribe: Cassieae Subtribe: Cassiinae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	Tropical Plants Database, Ken Fern. (2021). Senna italica. https://tropical.theferns.info/viewtropical.php?id=Senna+italica. [Accessed 23 Nov 2021]	"Although many species within the family Fabaceae have a symbiotic relationship with soil bacteria, this species is said to be devoid of such a relationship and therefore does not fix atmospheric nitrogen"
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"In experiments, the growth of Senna italica was enhanced by inoculation with a mixture of vesicular arbuscular mycorrhizal (VAM) inoculum. It does not produce root nodules."

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Neuwinger, H.D. (1996). African Ethnobotany: Poisons and Drugs: Chemistry, Pharmacology, Toxicology. CRC Press, Boca Raton, FL	"Shrubby or tree-like plant of rarely more than 50 cm high, often with herbaceous branches from a woody stock, more or less glaucous."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"A few collections of Senna italica are held in gene banks in Israel, the United Kingdom and Namibia. As the species is widespread and common, there is no threat of genetic erosion. It would be worthwhile, however, collecting local selections whenever encountered."

Qsn #	Question	Answer
602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is easily propagated by seed. Seed treatment by soaking overnight or abrasion with sand improves germination. Sowing in pockets at 5 seeds per pocket at 75 cm distance within and between rows and thinning to 3 plants per pocket is recommended. "

603	**Hybridizes naturally**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown. No evidence found

604	**Self-compatible or apomictic**	
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Unknown. Possibly] "Flowers bisexual, zygomorphic, 5-merous; sepals unequal, oblong-elliptical, up to 1 cm long, obtuse at apex; petals obovate, up to 13 mm long, yellow; stamens 10, the 2 lower ones largest, 5 medium-sized, 3 short and sterile; ovary superior, with short, stiff hairs, style up to 6 mm long."

605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna species have showy yellow, nectarless flowers that are buzz pollinated by pollen-collecting bees, especially large carpenter bees of the genus Xylocopa (Marazzi et al., 2007)."
	Gess, S. K., & Gess, F. W. (2014). Wasps and bees in southern Africa. SANBI Biodiversity Series 24. South African National Biodiversity Institute, Pretoria	[Bee-pollinated] "Senna italica was found in flower in the southern Kalahari and between Rehoboth and the Gamsberg Pass in Namibia. In all cases visitors were large Apidae. In the southern Kalahari what was taken to be a species of Xylocopa was in attendance, however, no voucher specimens were obtained. This sight identification was most probably correct, as Xylocopa species are frequent visitors to cultivated Cassia species. In Namibia Amegilla atrocincta (Lepeletier) and Anthophora (Paramegilla) armata Friese were frequent visitors. The flowers require to be buzzed as the anthers dehisce apically. All of these bees have the size and weight to be pollinators."

606	**Reproduction by vegetative fragmentation**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is easily propagated by seed. Seed treatment by soaking overnight or abrasion with sand improves germination. Sowing in pockets at 5 seeds per pocket at 75 cm distance within and between rows and thinning to 3 plants per pocket is recommended." [No evidence]

607	**Minimum generative time (years)**	**1**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Grow Plants. (2021). Senna italica. https://www.growplants.org/growing/senna-italica. [Accessed 26 Nov 2021]	"Fast growing / Medium growing"
	Wild Flower Nursery. (2021). Senna italica. https://wildflowernursery.co.za/indigenous-plant-database/senna-italica/. [Accessed 26 Nov 2021]	"Growth Rate: Fast"
	Mohammed, O. E. B. & Mahdi, A. R. A. E. (2016). Evaluation of the Life Cycle of Two Wild Plant Species; Senna (Cassia italica Mill.) and Handal (Citrullus colocynthsis L.). Nile Journal for Agricultural Sciences, 01: 97 - 117	"The life cycle of Senna plant in the first season, where the rainfall covered only the n1iddle section of the wadi, can be summarized in the following: 15 days between the emergence and first 2-4 leaves stage; 48 days through first flowering stage and the complete life-cycle is about 121 days. In the second season rain fall covered the three sections of the wadi, yet Senna plants were absent in the lower section and the plant co111pleted its life cycle in 109 to 116 days at the upper and middle sections. respectively. The life- cycle of Senna plant was significantly longer in the middle section in the 1st season and in tl1e upper and 1niddle sections in the 2nd season"

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Possibly. Seeds lack means of attachment, but presence along roadsides suggests some human-mediated dispersal] "Fruit a flattened, oblong pod 2.5–6 cm × 1.5–2 cm, with a ridge running along the middle of each valve, tip upcurved, dehiscent by 2 valves, many-seeded. Seeds oblong-ovate, compressed, 6–7.5 mm × 1.5–2.5 mm, with a small areole on each face. " ... "It is often found close to streams and in disturbed habitats such as roadsides and waste places."

702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Dispersed by: Humans"

703	**Propagules likely to disperse as a produce contaminant**	
	Source(s)	**Notes**
	Al-Rowaily, S. L., El-Bana, M. I., Al-Bakre, D. A., Assaeed, A. M., Hegazy, A. K., & Ali, M. B. (2015). Effects of open grazing and livestock exclusion on floristic composition and diversity in natural ecosystem of Western Saudi Arabia. Saudi Journal of Biological Sciences 22(4), 430-437	[Could possibly be spread as a pasture contaminant] "The dominant weedy species in the grazed site were C. procera, C. colocynthis, P. tomentosa, S. italica and S. incanum which are all widespread unpalatable species"

704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**

Qsn #	Question	Answer
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica spreads by seed. Seeds are dispersed by water and by animals (e.g. cattle) that eat the pods (Okeyo and Bosch, 2007)."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[No adaptations for long distance wind dispersal] "Fruit a flattened, oblong pod 2.5–6 cm × 1.5–2 cm, with a ridge running along the middle of each valve, tip upcurved, dehiscent by 2 valves, many-seeded. Seeds oblong-ovate, compressed, 6–7.5 mm × 1.5–2.5 mm, with a small areole on each face."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica spreads by seed. Seeds are dispersed by water and by animals (e.g. cattle) that eat the pods (Okeyo and Bosch, 2007)."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Commons along streams] "Senna italica is found in grassland of the drier regions of tropical Africa, from sea-level up to 1850 m altitude. It is often found close to streams and in disturbed habitats such as roadsides and waste places."

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Fruit a flattened, oblong pod 2.5–6 cm × 1.5–2 cm, with a ridge running along the middle of each valve, tip upcurved, dehiscent by 2 valves, many-seeded. Seeds oblong-ovate, compressed, 6–7.5 mm × 1.5–2.5 mm, with a small areole on each face."
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica spreads by seed. Seeds are dispersed by water and by animals (e.g. cattle) that eat the pods (Okeyo and Bosch, 2007)."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica spreads by seed. Seeds are dispersed by water and by animals (e.g. cattle) that eat the pods (Okeyo and Bosch, 2007)."

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Senna italica spreads by seed. Seeds are dispersed by water and by animals (e.g. cattle) that eat the pods (Okeyo and Bosch, 2007)."

801	Prolific seed production (>1000/m2)	
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Densities unknown] "Fruit a flattened, oblong pod 2.5–6 cm × 1.5–2 cm, with a ridge running along the middle of each valve, tip upcurved, dehiscent by 2 valves, many-seeded. Seeds oblong-ovate, compressed, 6–7.5 mm × 1.5–2.5 mm, with a small areole on each face."

Qsn #	Question	Answer
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). (2008). Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Senna italica is easily propagated by seed. Seed treatment by soaking overnight or abrasion with sand improves germination. Sowing in pockets at 5 seeds per pocket at 75 cm distance within and between rows and thinning to 3 plants per pocket is recommended." [Longevity unknown]
	Royal Botanic Gardens Kew. (2021) Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/ . [Accessed 26 Nov 2021]	"Storage Behaviour: Orthodox Storage Conditions: Long-term storage under IPGRI preferred conditions at RBG Kew, WP. Oldest collection11 years; germination change 100 to 100%, 10 years, 1 collection"
	Johannsmeier, A. E. (2011). Seed bank strategies in a Kalahari ecosystem in relation to grazing and habitats. MSc Thesis. University of Pretoria, Pretoria	[Longevity unspecified] "Many of the species may be perennial dicotyledons with persistent seed banks (such as Hermannia tomentosa and Senna italica) and which prefer disturbed areas to grow in."

803	**Well controlled by herbicides**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown. No evidence of control. Several invasive Senna species are effectively controlled with herbicides, which would likely work on Senna italica if needed

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y**
	Source(s)	**Notes**
	CABI. (2021). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"Tolerates, or benefits from, cultivation, browsing pressure, mutilation, fire etc"

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Broad climate suitability and environmental versatility
• Grows and spreads in tropical climates
• Naturalized in the Caribbean and Venezuela (no evidence in the Hawaiian Islands)
• A weed of pastures, disturbed areas, waterways, and wastelands (and reported to displace native species in these habitats)
• Other Senna species are invasive
• Potentially allelopathic
• Conflicting reports on unpalatability to browsing animals
• May possess toxic properties
• Tolerates many soil types (unlikely to be substrate limited)
• Reproduces by seeds
• Fast growth rate, and reaches maturity in <1 year
• Seeds dispersed internally by animals, water and intentionally by people
• Tolerates, or benefits from, cultivation, browsing pressure, mutilation, fire

Low Risk Traits
• Unarmed (no spines, thorns, or burrs)
• Thrives in disturbed, high light environments (dense shade my limit spread)
• Not reported to spread vegetatively