

<b>Taxon:</b> <i>Tylosema fassoglense</i> (Kotschy ex Schweinf.) Torre & Hillc.	<b>Family:</b> Fabaceae
<b>Common Name(s):</b> bauhinia rampant creeping bauhinia marama bean olomapa sprawling bauhinia	<b>Synonym(s):</b> <i>Bauhinia bequaertii</i> <i>Bauhinia cissoides</i> <i>Bauhinia fassoglensis</i> <i>Bauhinia kirkii</i> <i>Bauhinia welwitschii</i>

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Approved	<b>End Date:</b> 4 Sep 2024
<b>WRA Score:</b> -2.0	<b>Designation:</b> L	<b>Rating:</b> <span style="background-color: yellow;">Low Risk</span>

**Keywords:** Perennial Herb/Shrub, Tuberos, Edible, Fire Regenerating, Dehiscent Pods

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	?
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n = question 205	n
302	Garden/amenity/disturbance weed	y = 1*multiplier (see Appendix 2), n = 0	n
303	Agricultural/forestry/horticultural weed		
304	Environmental weed	y = 2*multiplier (see Appendix 2), n = 0	n
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	n
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	y = 1, n = -1	n
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	y = 1, n = 0	n
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	y
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	y
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	y = 1, n = -1	n
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	2
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y = 1, n = -1	n
702	Propagules dispersed intentionally by people	y = 1, n = -1	y
703	Propagules likely to disperse as a produce contaminant	y = 1, n = -1	n
704	Propagules adapted to wind dispersal	y = 1, n = -1	n
705	Propagules water dispersed		
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		
801	Prolific seed production (>1000/m2)	y = 1, n = -1	n
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
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	[No evidence] "Tylosema fassoglense occurs wild from Sudan and Ethiopia southwards to Namibia, Mozambique and South Africa ." ... "Tylosema fassoglense is collected from the wild."
102	Has the species become naturalized where grown?	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2024). Personal Communication	NA
103	Does the species have weedy races?	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2024). 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
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Origin and geographic distribution: Tylosema fassoglense occurs wild from Sudan and Ethiopia southwards to Namibia, Mozambique and South Africa ."
202	Quality of climate match data	High
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Origin and geographic distribution: Tylosema fassoglense occurs wild from Sudan and Ethiopia southwards to Namibia, Mozambique and South Africa ."
203	Broad climate suitability (environmental versatility)	y
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	[Broad elevation range >2000 m] "Tylosema fassoglense occurs up to 2100 m altitude in woodland and grassland, sometimes in cultivated areas. It grows well on poor, sandy soils, but is also found on rocky or clay soils. It is moderately tolerant to flooding and drought."
204	Native or naturalized in regions with tropical or subtropical climates	y
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Origin and geographic distribution: Tylosema fassoglense occurs wild from Sudan and Ethiopia southwards to Namibia, Mozambique and South Africa ."
205	Does the species have a history of repeated introductions outside its natural range?	?

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Johnson, M.B. (2016). Survival and Performance of Cultivated Woody Legume Species in Yuma, Arizona. <i>Desert Plants</i> 31(2): 1-68	"Information on the performance of these plants is missing. They survived into their third season, but then died. They may have been killed by gophers." [Previously cultivated in Arizona]
	Dave's Garden. (2024). <i>Tylosema</i> Species, Orchid Tree - <i>Tylosema fassoglensis</i> . <a href="https://davesgarden.com/guides/pf/go/118545">https://davesgarden.com/guides/pf/go/118545</a> . [Accessed 3 Sep 2024]	"This plant is said to grow outdoors in the following regions: Homestead, Florida"
	Brink, M. & Belay, G. (Editors). (2006). <i>Plant Resources of Tropical Africa. Volume 1. Cereals and pulses</i> . PROTA Foundation. Wageningen, Netherlands	" <i>Tylosema fassoglense</i> occurs wild from Sudan and Ethiopia southwards to Namibia, Mozambique and South Africa ." [Cultivation outside native range not documented]
	WRA Specialist. (2024). Personal Communication	Proposed for cultivation in Hawaii

301	Naturalized beyond native range	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2024). <i>Plants of Hawai'i</i> . <a href="http://www.plantsofhawaii.org">http://www.plantsofhawaii.org</a> . [Accessed 3 Sep 2024]	No evidence
	USDA, Agricultural Research Service, National Plant Germplasm System. (2024). <i>Germplasm Resources Information Network (GRIN-Taxonomy)</i> . National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearch">https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearch</a> . [Accessed 3 Sep 2024]	No evidence

302	Garden/amenity/disturbance weed	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2024). <i>CABI Compendium Invasive Species</i> . <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 3 Sep 2024]	No evidence

303	Agricultural/forestry/horticultural weed	n
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	[Cited as an agricultural weed. Impacts unknown] "Tylosema fassoglensis (Kotschy) Torre & Hillc. Fabaceae - Caesalpiniaceae Total N° of Refs: 1 Habit: Shrub Preferred Climate/s: Dryland, Tropical Major Pathway/s: Crop, Ornamental Dispersed by: Humans References: Tanzania-A-2076."

304	Environmental weed	n
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2024). CABI Compendium Invasive Species. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 3 Sep 2024]	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2024). CABI Compendium Invasive Species. <a href="https://www.cabidigitallibrary.org/product/qi">https://www.cabidigitallibrary.org/product/qi</a> . [Accessed 3 Sep 2024]	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	[No evidence] "Perennial herb or shrub, with tuberous root; stem prostrate and trailing or climbing, up to 6 m long, herbaceous or woody below, young parts rusty-tomentose or rusty. hairy, with axillary forked tendrils (2-)3-6.5(-9.5) mm long. Leaves alternate, simple; stipules 2- 4 mm x 2 mm, persistent; petiole (2-)3-10(-20) cm long; blade bilobed for up to one-third (sometimes up to half) its length , (5 -)7-13(-20) cm x (4-)8--15(-24) cm, base deeply cordate, lobes ovate to obovate, sometimes rounded, subglabrous to densely rusty pubescent beneath. Inflorescence a lateral raceme 5-45 cm long; peduncle (2-)4-12(-18) cm long. Flowers bisexual, zygomorphic, 5-merous, heterostylous; pedicel (1.5-)2-4.5(-6) cm long; sepals 1- 1.5(-2.5) cm x 3-4 mm, with upper 2 completely united and the other 3 free; petals unequal, 4 (larger ones) obovate-circular, (1.5-) 2-4(-4.5) cm x 1-3 cm and tapering into a basal claw, the upper one much smaller, yellow, sometimes fading to pink; stamens 2, free, with filaments 10-18 mm long, staminodes 8, with filaments 3-6 mm long; ovary superior, 5-6 mm long, 1-celled, pubescent, style elongate, stigma small. Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm, chestnut-brown to black."

402	Allelopathic	n
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Perennial herb or shrub, with tuberous root"

404	Unpalatable to grazing animals	n
	Source(s)	Notes

Qsn #	Question	Answer
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"cattle and goat fodder, leaves and young branches grazed,"
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"The leaves and young branches of <i>Tylosema fassoglense</i> are grazed."

405	Toxic to animals	
	Source(s)	Notes
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Fed to animals, but contains chemicals that are used as a fish poison and insecticide] "seeds baked and eaten or boiled and roasted, young pods eaten raw or cooked, fresh seeds eaten raw, cattle and goat fodder, leaves and young branches grazed, bee forage, water obtained from the tubers, sap from the shoots used as potable water" ... "Veterinary medicine, root decoctions administered as a galactagogue to cows before calving. Fish poison and insecticide from the leaves."
	Tropical Plants Database, Ken Fern. (2024). <i>Tylosema fassoglense</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Tylosema+fassoglense">https://tropical.theferns.info/viewtropical.php?id=Tylosema+fassoglense</a> . [Accessed 30 Aug 2024]	[Possibly] "The plant contains rotenone and has been used traditionally as a fish poison[398] - the rotenone kills or stuns the fish making them easy to catch, but the fish remain perfectly edible for mammals. Rotenone is classified by the World Health Organization as moderately hazardous. It is mildly toxic to humans and other mammals, but extremely toxic to many insects (hence its use as an insecticide) and aquatic life, including fish. This higher toxicity in fish and insects is because the lipophilic rotenone is easily taken up through the gills or trachea, but not as easily through the skin or the gastrointestinal tract. The lowest lethal dose for a child is 143 mg/kg, but human deaths from rotenone poisoning are rare because its irritating action causes vomiting. Deliberate ingestion of rotenone, however, can be fatal. The compound decomposes when exposed to sunlight and usually has an activity of six days in the environment."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	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. Used medicinally and contains chemicals used as a fish poison and insecticide] "seeds baked and eaten or boiled and roasted, young pods eaten raw or cooked, fresh seeds eaten raw, cattle and goat fodder, leaves and young branches grazed, bee forage, water obtained from the tubers, sap from the shoots used as potable water" ... (Stem and leaves astringent, stomachic, febrifuge, for diarrhea. Infusions of powdered flowers drunk against jaundice and hypertension. Roots and flowers decoction drunk to treat impotence; root decoction a remedy for stomachache, gastrointestinal problems, diarrhea, anemia, fever and pneumonia, and after childbirth. Pulverized tuber taken for the treatment of venereal diseases; tubers used for backache. Veterinary medicine, root decoctions administered as a galactagogue to cows before calving. Fish poison and insecticide from the leaves.)"

Qsn #	Question	Answer
	Tropical Plants Database, Ken Fern. (2024). <i>Tylosema fassoglense</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Tylosema+fassoglense">https://tropical.theferns.info/viewtropical.php?id=Tylosema+fassoglense</a> . [Accessed 30 Aug 2024]	[Possibly] "The plant contains rotenone and has been used traditionally as a fish poison[398] - the rotenone kills or stuns the fish making them easy to catch, but the fish remain perfectly edible for mammals. Rotenone is classified by the World Health Organization as moderately hazardous. It is mildly toxic to humans and other mammals, but extremely toxic to many insects (hence its use as an insecticide) and aquatic life, including fish. This higher toxicity in fish and insects is because the lipophilic rotenone is easily taken up through the gills or trachea, but not as easily through the skin or the gastrointestinal tract. The lowest lethal dose for a child is 143 mg/kg, but human deaths from rotenone poisoning are rare because its irritating action causes vomiting. Deliberate ingestion of rotenone, however, can be fatal. The compound decomposes when exposed to sunlight and usually has an activity of six days in the environment."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . <i>Flowering Plants of Africa</i> 62: 70-79	[Grows back following fires, but not reported to increase fire risk] " <i>Tylosema fassoglense</i> is predominantly associated with open areas in savanna and woodland, less often with grassland. In many parts of its range, plants are regularly subjected to fire during the dry season. The root tubers can grow very large and are known to exceed 80 kg. When active growth resumes in spring, often following a fire, new shoots sprout very rapidly from these tubers, with young stems elongating at a growth rate of up to 50 mm per day (Brink 2006)."
	Brink, M. & Belay, G. (Editors). (2006). <i>Plant Resources of Tropical Africa. Volume 1. Cereals and pulses</i> . PROTA Foundation. Wageningen, Netherlands	[No evidence of increased fire risk. Tolerates fire] "Regeneration after fire is rapid." ... " <i>Tylosema fassoglense</i> occurs up to 2100 m altitude in woodland and grassland, sometimes in cultivated areas. It grows well on poor, sandy soils, but is also found on rocky or clay soils. It is moderately tolerant to flooding and drought."

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	French, B.R. & Maynard, A.R. (2022). <i>Food Plants International Database</i> . Food Plants International. <a href="https://foodplantsinternational.com/">https://foodplantsinternational.com/</a> . [Accessed 3 Sep 2024]	"It needs full sun."
	Tropical Plants Database, Ken Fern. (2024). <i>Tylosema fassoglense</i> . <a href="https://tropical.theferns.info/viewtropical.php?id=Tylosema+fassoglense">https://tropical.theferns.info/viewtropical.php?id=Tylosema+fassoglense</a> . [Accessed 3 Sep 2024]	"Succeeds in sunny positions and dappled shade."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	French, B.R. & Maynard, A.R. (2022). <i>Food Plants International Database</i> . Food Plants International. <a href="https://foodplantsinternational.com/">https://foodplantsinternational.com/</a> . [Accessed 3 Sep 2024]	"It needs well-drained soil."
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . <i>Flowering Plants of Africa</i> 62: 70-79	" <i>T. fassoglense</i> prefers subtropical and tropical conditions and is found on a wide range of substrates, including rocky and clay soils."
	Brink, M. & Belay, G. (Editors). (2006). <i>Plant Resources of Tropical Africa. Volume 1. Cereals and pulses</i> . PROTA Foundation. Wageningen, Netherlands	" <i>Tylosema fassoglense</i> occurs up to 2100 m altitude in woodland and grassland, sometimes in cultivated areas. It grows well on poor, sandy soils, but is also found on rocky or clay soils. It is moderately tolerant to flooding and drought."

411	Climbing or smothering growth habit	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Perennial herb or shrub, with tuberous root; stem prostrate and trailing or climbing, up to 6 m long, herbaceous or woody below, young parts rusty-tomentose or rusty-hairy, with axillary forked tendrils (2-)3-6.5(-9.5) mm long."

412	Forms dense thickets	n
	<b>Source(s)</b>	<b>Notes</b>
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . Flowering Plants of Africa 62: 70-79	[No evidence] " <i>Tylosema fassoglense</i> is predominantly associated with open areas in savanna and woodland, less often with grassland. In many parts of its range, plants are regularly subjected to fire during the dry season."
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	[No evidence] " <i>Tylosema fassoglense</i> occurs up to 2100 m altitude in woodland and grassland, sometimes in cultivated areas. It grows well on poor, sandy soils, but is also found on rocky or clay soils. It is moderately tolerant to flooding and drought."

501	Aquatic	n
	<b>Source(s)</b>	<b>Notes</b>
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . Flowering Plants of Africa 62: 70-79	" <i>Tylosema fassoglense</i> is predominantly associated with open areas in savanna and woodland, less often with grassland. In many parts of its range, plants are regularly subjected to fire during the dry season."

502	Grass	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2024). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearch">https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearch</a> . [Accessed 30 Aug 2024]	"Genus: <i>Tylosema</i> Family: Fabaceae (alt. Leguminosae) Subfamily: Cercidoideae Tribe: Cercideae Subtribe: Bauhiniinae"

503	Nitrogen fixing woody plant	n
	<b>Source(s)</b>	<b>Notes</b>
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . Flowering Plants of Africa 62: 70-79	"As in most legumes belonging to subfamily Caesalpinioideae, the roots of <i>Tylosema</i> do not form nitrogen-fixing bacterial nodules (Grobbelaar & Clarke 1975)."



Qsn #	Question	Answer
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Perennial herb or shrub, with tuberous root;"
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . Flowering Plants of Africa 62: 70-79	" <i>Tylosema fassoglense</i> is predominantly associated with open areas in savanna and woodland, less often with grassland. In many parts of its range, plants are regularly subjected to fire during the dry season. The root tubers can grow very large and are known to exceed 80 kg. When active growth resumes in spring, often following a fire, new shoots sprout very rapidly from these tubers, with young stems elongating at a growth rate of up to 50 mm per day (Brink 2006)."

601	Evidence of substantial reproductive failure in native habitat	n
	<b>Source(s)</b>	<b>Notes</b>
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . Flowering Plants of Africa 62: 70-79	[No evidence] " <i>T. fassoglense</i> , the most wide-ranging species, forms the subject of the present account. Occurring from Sudan southwards through eastern and central tropical Africa to southern Africa, it reaches the southernmost limits of its range in northeastern KwaZulu-Natal (Figure 1). This distribution closely matches the geographical range of the genus as a whole."

Qsn #	Question	Answer
602	Produces viable seed	y
	<b>Source(s)</b>	<b>Notes</b>
	French, B.R. & Maynard, A.R. (2022). Food Plants International Database. Food Plants International. <a href="https://foodplantsinternational.com/">https://foodplantsinternational.com/</a> . [Accessed 4 Sep 2024]	"Plants can be grown from seeds."
	Otieno, V., Ulian, T., Nzube, F., & Kimenju, J. (2020). Germination response to temperature and water potential for sprawling bauhinia ( <i>Tylosema fassoglense</i> ), a potential crop for Kenya. <i>South African Journal of Botany</i> , 132, 463-470	"The knowledge of cardinal temperatures is critical for understanding environmental tolerance limits for germinating plant species. However, this information is not readily available for <i>Tylosema fassoglense</i> [Family: Fabaceae]; despite its potential as a future crop to improve nutrition and enhance sustainable agriculture in Kenya. The objective of this study was to characterise seed germination responses to temperature and water potential of seed lots of <i>T. fassoglense</i> seeds collected from three counties in Kenya; namely Busia, Migori and Siaya. Scarified seeds were germinated at a wide range of constant temperatures from 10 to 45 °C with intervals of 5 °C and water potentials from 0, -0.25, -0.5, -1.0, -1.5 Megapascal (MPa) at 25 °C. Seeds of <i>T. fassoglense</i> had a wide range of germination temperature of 20 °C (from 15 to 35 °C). Low (10 °C) and high (40 °C) temperatures significantly reduced germination in the three seed lots. Busia seed lot had the lowest final germination of 5% at 10 °C while germination was zero at 45 °C in all the seed lots tested. The calculated base, optimal and ceiling temperature (T <sub>b</sub> , T <sub>o</sub> and T <sub>c</sub> ) ranges were 4.05 - 8.0 °C; 33.61 - 35.75 °C; and 46.54 - 47.24 °C, respectively. Suboptimal and supraoptimal thermal time (uT(50)) ranged between 76.19 - 89.02 degree celcius days (°C d) and 30.3 - 41.89 °C d respectively. Water potential of -0.5 MPa significantly reduced final germination to less than 50% in all seed lots while germination was zero at both -1.0 and -1.5 MPa. The base water potential (C <sub>b</sub> ) and hydro time (uH(20)) was between -0.92 to -0.97 MPa and 3.95 - 4.11 Megapascal days (MPad) respectively. The optimum temperature range for germination was 30 - 35 °C and seeds were tolerant to low water potential up to -0.5 MPa. However, further studies will need to be carried out on germination in the supraoptimal temperature range and water potential between 0 and -1.0 MPa. The findings in this study will be useful in future research contributing towards domestication of <i>T. fassoglense</i> ."

603	Hybridizes naturally	
	<b>Source(s)</b>	<b>Notes</b>
	Masters, L. (2020). An Investigation into the Systematics and Population Diversity of <i>Tylosema</i> (Leguminosae) (Master's thesis, University of Pretoria, Pretoria, South Africa	[Unknown] "The phylogeny from the combined dataset showed that <i>T. angolense</i> and <i>T. fassoglense</i> belong to the same lineage. It is conceivable that these intermediate <i>Tylosema</i> are hybrids of the two species, considering how frequently plant species hybridize and that recently diverging species may not have well evolved reproductive boundaries (Soltis and Soltis, 2009). <i>T. fassoglense</i> is known to display a wide variety of morphological characters across its wide distribution (Coetzer et al., 2011). The recent discovery of <i>T. angolense</i> warrants a further investigation into the purported morphological variability found in <i>T. fassoglense</i> : undescribed <i>Tylosema</i> sp. have likely been identified as <i>T. fassoglense</i> across sub-Saharan Africa given the taxonomic neglect the genus has received."

604	Self-compatible or apomictic	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). <i>Plant Resources of Tropical Africa. Volume 1. Cereals and pulses.</i> PROTA Foundation. Wageningen, Netherlands	"It is predominantly outcrossing and may be self-incompatible" [ <i>Tylosema esculentum</i> ]

Qsn #	Question	Answer
	Masters, L. (2020). An Investigation into the Systematics and Population Diversity of <i>Tylosema</i> (Leguminosae) (Master's thesis, University of Pretoria, Pretoria, South Africa)	" <i>Tylosema</i> species are likely obligate out crossers given that they are heterostylous (Hartley et al., 2003), and speciation events across the genus could have taken place relatively recently (Castro et al., 2006; Coetzer et al., 2011)."

605	Requires specialist pollinators	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"It is predominantly outcrossing and may be self-incompatible; it is pollinated by insects." [ <i>Tylosema esculentum</i> pollination syndrome likely similar for <i>T. fassoglense</i> ]
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . Flowering Plants of Africa 62: 70-79	[Adapted for insect pollination] "During a study of the pollination biology of <i>Tylosema esculentum</i> , it was found that the fertile anthers produce mucilage in which the pollen is suspended soon after opening to release the mature pollen (De Frey et al. 1992). In <i>T. fassoglense</i> , pollen is similarly viscid and somewhat oily (Rand 1909). This is a unique phenomenon because pollen is usually released in a semidry state and dries even more after shedding. A possible explanation of the function of this mucilage is that it protects the pollen from dehydration and promotes adhesion to a pollinator's body and, therefore, positively influences the germinability and longevity of the pollen. Pollen grains are similar in size and morphology between the two flower morphs, unlike the grain dimorphism frequently reported in other distylous species (Hartley et al. 2002; Castro et al. 2005). All species of <i>Tylosema</i> have rather similar pollen grains, although slight interspecific differences, mainly in size, do exist (Coetzer et al. 1981; Castro et al. 2005)."

606	Reproduction by vegetative fragmentation	n
	<b>Source(s)</b>	<b>Notes</b>
	French, B.R. & Maynard, A.R. (2022). Food Plants International Database. Food Plants International. <a href="https://foodplantsinternational.com/">https://foodplantsinternational.com/</a> . [Accessed 4 Sep 2024]	"Plants can be grown from seeds."

607	Minimum generative time (years)	2
	<b>Source(s)</b>	<b>Notes</b>
	Bagai, K. (2020). Identification of mongongo ( <i>Schinziophyton rautanenii</i> ) and morama ( <i>Tylosema esculentum</i> ) insect pests and their natural enemies in Botswana. Master of Science Thesis. Botswana University of Agriculture and Natural Resources, Gaborone, Botswana	"In its natural stands, morama bean takes between 18-24 months to reach reproduction maturity." [Time to maturity for <i>Tylosema esculentum</i> likely applicable for <i>T. fassoglense</i> ]
	French, B.R. & Maynard, A.R. (2022). Food Plants International Database. Food Plants International. <a href="https://foodplantsinternational.com/">https://foodplantsinternational.com/</a> . [Accessed 4 Sep 2024]	"Plants grow rapidly. Tubers up to 78 kg have been recorded. Seeds are collected at the ends of the rainy season."

Qsn #	Question	Answer
701	<b>Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm, chestnut-brown to black." [No evidence. Pods and seeds large and lack means of external attachment]
	Garrison, W. J. (1997). Functional morphology of ballistic seed dispersal in two angiosperms. PhD Dissertation. The University of Mississippi, University, MS	"Table 1. Literature reports of taxa with ballistic seed dispersal." [Includes <i>Tylosema fassoglense</i> ]

702	<b>Propagules dispersed intentionally by people</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Crop, Ornamental Dispersed by: Humans"

703	<b>Propagules likely to disperse as a produce contaminant</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm, chestnut-brown to black." [No evidence. Pods and seeds large and unlikely to become a seed contaminant]

704	<b>Propagules adapted to wind dispersal</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm, chestnut-brown to black." [Wind may facilitate some movement, but pods and seeds relatively large]
	Garrison, W. J. (1997). Functional morphology of ballistic seed dispersal in two angiosperms. PhD Dissertation. The University of Mississippi, University, MS	"Table 1. Literature reports of taxa with ballistic seed dispersal." [Includes <i>Tylosema fassoglense</i> . Not adapted for wind dispersal, but wind may contribute to further movement of seeds]

705	<b>Propagules water dispersed</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm, chestnut-brown to black." [Possibly, if cultivated near water, but no direct evidence found]

706	<b>Propagules bird dispersed</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm, chestnut-brown to black." [No adaptations for bird dispersal]

Qsn #	Question	Answer
707	Propagules dispersed by other animals (externally)	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2- seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm" [Large pods and seeds with no means of external attachment]
708	Propagules survive passage through the gut	
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"The leaves and young branches of <i>Tylosema fassoglense</i> are grazed." [Unknown if seeds are intentionally or accidentally consumed, or if they survive gut passage]
801	Prolific seed production (>1000/m2)	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Fruit an obovoid to oblong-ovoid pod 5-12 cm x 3-7.5 cm, flattened, woody, 1-2-seeded. Seeds ellipsoid to globose, somewhat compressed, 1.5-3 cm x 1-2 cm" [Few seeded pods with relatively large seeds]
802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Gashaw, M., & Michelsen, A. (2002). Influence of heat shock on seed germination of plants from regularly burnt savanna woodlands and grasslands in Ethiopia. <i>Plant Ecology</i> , 159, 83-93	[Survives high heat and fire, and may persist in the soil until fires occur] "The third group of species comprised <i>Acacia seyal</i> , <i>Entada</i> , <i>Tamarindus</i> , <i>Ziziphus mauritiana</i> , <i>Cassia</i> and <i>Tylosema</i> , which resisted temperature treatments up to 150 and 200 °C, probably because of their thick seed coats and low seed surface to volume ratio. The capacity of these species to germinate both at low temperatures and after exposure to even 150 and 200 °C ensures regeneration both without fire and following removal of the insulating canopy or litter by fire disturbances."
803	Well controlled by herbicides	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2024). Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Belay, G. (Editors). (2006). Plant Resources of Tropical Africa. Volume 1. Cereals and pulses. PROTA Foundation. Wageningen, Netherlands	"Growth of <i>Tylosema fassoglense</i> is rapid, with the shoots growing up to 5 cm per day. In southern Africa <i>Tylosema fassoglense</i> flowers from October to March. Regeneration after fire is rapid."
	Coetzer, L.A., van Wyk, A.E. & Buitendag, E. (2011). <i>Tylosema fassoglense</i> . <i>Flowering Plants of Africa</i> 62: 70-79	"In many parts of its range, plants are regularly subjected to fire during the dry season. The root tubers can grow very large and are known to exceed 80 kg. When active growth resumes in spring, often following a fire, new shoots sprout very rapidly from these tubers, with young stems elongating at a growth rate of up to 50 mm per day (Brink 2006)."

Qsn #	Question	Answer
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. (2024). Personal Communication	Unknown

**Summary of Risk Traits:**

*Tylosema fassoglense* (sprawling bauhinia, creeping bauhinia), is a perennial herb or shrub, with tuberous roots, native from Sudan and Ethiopia southwards to Namibia, Mozambique, and South Africa. It occurs up to 2100 m altitude in woodland and grassland, sometimes in cultivated areas, on poor, sandy soils, but is also found on rocky or clay soils. It is also moderately tolerant to flooding and drought. The immature and mature seeds and pods of *Tylosema fassoglense* can be eaten raw but are usually cooked or roasted. It is not currently documented to be naturalized or invasive outside its native range.

**High Risk / Undesirable Traits**

Thrives and can potentially spread in regions with tropical climates  
Broad climate suitability  
Raw seeds and tubers may contain toxic constituents  
Tolerates many soil types (substrate unlikely to limit potential spread)  
Capable of producing climbing stems that could overtop other vegetation  
Reproduces by seed  
Seeds dispersed by dehiscent pods and intentional cultivation  
Resprouts after fire from tuberous roots

**Low Risk Traits**

No reports of invasive or negative impacts where cultivated  
Unarmed (no spines, thorns, or burrs)  
Palatable to animals  
Grows best in high light environments (dense shade may inhibit spread)  
Relatively large pods and seeds unlikely to be accidentally spread