

Taxon: <i>Sanguisorba minor Scop.</i>	Family: Rosaceae
Common Name(s): garden burnet little burnet small burnet	Synonym(s): <i>Pimpinella minor</i> (Scop.) Lam. <i>Poterium minus</i> (Scop.) Gray

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 25 Jan 2019
WRA Score: 10.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Perennial Forb, Naturalized, Fodder, Animal-Dispersed, Seed Bank

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)	Intermediate
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		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
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		

Qsn #	Question	Answer Option	Answer
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		
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	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
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)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal		
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	y
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m ²)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	y
803	Well controlled by herbicides	y=-1, n=1	y
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
	Prance, G. & Nesbitt, M. (2005). The Cultural History of Plants. Routledge, New York, NY	[Long cultivated, but no evidence of heavy domestication] "Salad burnet, <i>Sanguisorba minor</i> , is the species usually cultivated in gardens. It is native to the Mediterranean countries, Asia Minor, Iraq, Iran, Afghanistan, and Middle Asia. Today it is cultivated sporadically in Europe, including Britain, Germany, and France, and in North America and Asia. The leaves have a pleasant cucumber flavor and have been eaten since classical Greek times and were commonly used in salads from the 15th to 19th centuries."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

Qsn #	Question	Answer
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	Intermediate
	Source(s)	Notes
	<p>USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jan 2019]</p>	<p>"Native Africa MACARONESIA: Spain [Canary Islands] NORTHERN AFRICA: Algeria, Egypt, Libya, Morocco, Tunisia Asia-Temperate WESTERN ASIA: Afghanistan, Cyprus, Iran, Iraq, Israel, Jordan, Lebanon, Syria, Turkey CAUCASUS: Armenia, Azerbaijan, Georgia, Russian Federation, [Dagestan] Russian Federation-Ciscaucasia [Ciscaucasia] SIBERIA: Russian Federation-Western Siberia [Western Siberia] Europe NORTHERN EUROPE: Denmark, Ireland, United Kingdom MIDDLE EUROPE: Austria, Belgium, Czech Republic, Germany, Hungary, Netherlands, Poland, Slovakia, Switzerland EASTERN EUROPE: Lithuania, Russian Federation-European part, [European part] Ukraine (incl. Krym) SOUTHEASTERN EUROPE: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece (incl. Crete), Italy (incl. Sardinia, Sicily), Macedonia, Montenegro, Romania, Serbia, Slovenia SOUTHWESTERN EUROPE: France, Portugal, Spain"</p>
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Preferred Climate/s: Mediterranean"

202	Quality of climate match data	High
	Source(s)	Notes
	<p>USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jan 2019]</p>	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	<p>Missouri Botanical Garden. (2019). <i>Sanguisorba minor</i>. http://www.missouribotanicalgarden.org. [Accessed 24 Jan 2019]</p>	"Zone: 4 to 8" [5 hardiness zones]

Qsn #	Question	Answer
	<p>Fryer, J. L. 2008. <i>Sanguisorba minor</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html. [Accessed 24 Jan 2019]</p>	<p>[Elevation range in temperate and Mediterranean climates exceeds 1000 m, demonstrating some environmental versatility] ""Small burnet elevational ranges in the western United States: California - 100-5,200 feet (30-1,600 m) [49] Nevada - 6,500-7,500 feet (2,000-2,300 m) [61] Utah - 5,000-7,005 feet (1,525-2,135 m) [155] New Mexico - 6,000-7,500 feet (1,800-2,300 m) [74] Intermountain West 5,200-8,900 feet (1,600-2,700 m) [18] Elevational ranges in Eurasia Europe - sea level-4,600 feet (0-1,400 m) Iran and Afghanistan - 5,900-6,600 feet (1,800-2,000 m) (review by [29])"</p>

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	<p>USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 24 Jan 2019]</p>	<p>"Native Africa MACARONESIA: Spain [Canary Islands] NORTHERN AFRICA: Algeria, Egypt, Libya, Morocco, Tunisia Asia-Temperate WESTERN ASIA: Afghanistan, Cyprus, Iran, Iraq, Israel, Jordan, Lebanon, Syria, Turkey CAUCASUS: Armenia, Azerbaijan, Georgia, Russian Federation, [Dagestan] Russian Federation-Ciscaucasia [Ciscaucasia] SIBERIA: Russian Federation-Western Siberia [Western Siberia] Europe NORTHERN EUROPE: Denmark, Ireland, United Kingdom MIDDLE EUROPE: Austria, Belgium, Czech Republic, Germany, Hungary, Netherlands, Poland, Slovakia, Switzerland EASTERN EUROPE: Lithuania, Russian Federation-European part, [European part] Ukraine (incl. Krym) SOUTHEASTERN EUROPE: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece (incl. Crete), Italy (incl. Sardinia, Sicily), Macedonia, Montenegro, Romania, Serbia, Slovenia SOUTHWESTERN EUROPE: France, Portugal, Spain"</p>
	<p>Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall</p>	<p>"<i>Sanguisorba minor</i> ... Preferred Climate/s: Mediterranean Origin: Africa, E Asia, Europe" ... "<i>Sanguisorba minor</i> Scop. subsp. <i>muricata</i> (Spach) Briq. ... Preferred Climate/s: Mediterranean, Subtropical, Tropical"</p>
	<p>WRA Specialist. (2019). Personal Communication</p>	<p>Certain subspecies can grow in subtropical climates, but primarily a temperate to Mediterranean species</p>

Qsn #	Question	Answer
205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Small burnet is native to Europe, western Asia and Siberia, and northern Africa [41,109,112]. It is nonnative in North America, South America, Australia, and New Zealand. Most North American small burnet populations originated in Europe [49,50,89,132,155]."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"It is very rarely invasive [7,78,119,156], typically occurring in small populations in only a few counties of the states in which it grows (for example, see [74,78,101,132]). In western North America, small burnet occurs sporadically from British Columbia east to Montana and south to California, New Mexico, and Nebraska [18,60,64]. It is also sporadically distributed to the east [42,110] from Ontario east to Nova Scotia and south to Tennessee and North Carolina [60,110]."
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 24 Jan 2019]	"Naturalized (natzd. elsewhere)"
	Queensland Government. (2019). Weeds of Australia. <i>Sanguisorba minor</i> . http://keyserver.lucidcentral.org . [Accessed 24 Jan 2019]	"Widely naturalised in southern Australia (i.e. in eastern and southern New South Wales, in the ACT, in Victoria and Tasmania, in many parts of South Australia, and in south-western Western Australia). Occasionally also naturalised in south-eastern Queensland."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Wheeler, J.R., Marchant, N.G.& Lewington, M. 2002. Flora of the South West: Dicotyledons. UWA Publishing, Crawley, Western Australia	"Occasionally naturalised in disturbed areas." ... "Note: Only subsp. <i>muricala</i> is naturalised in Australia."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Cereals, Pastures" [A crop weed of unspecified impacts]
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	[A potential environmental weed] "There was a report of small burnet being invasive in a pasture in Wyoming. This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	[Disturbance adapted] "In the East, small burnet is reported mostly on disturbed sites [101,110,132,149] and "waste places" [101]. It grows on cliffs in the Carolinas [101]."

303	Agricultural/forestry/horticultural weed	
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Qsn #	Question	Answer
	Source(s)	Notes
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"Small burnet is an introduced species and establishes and can spread relatively quickly via seed distribution. Generally, it is not considered "weedy" or an invasive species, but can spread into adjoining vegetative communities under ideal climatic and environmental conditions. There was a report of it having invasive weedy characteristics in a pasture in Wyoming."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Small burnet was deliberately introduced as a pasture and rehabilitation forb. It is very rarely invasive [7,78,119,156], typically occurring in small populations in only a few counties of the states in which it grows (for example, see [74,78,101,132])."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Weed of: Cereals, Pastures"

304	Environmental weed	
	Source(s)	Notes
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"Environmental Concerns - Small burnet is an introduced species and establishes and can spread relatively quickly via seed distribution. Generally, it is not considered "weedy" or an invasive species, but can spread into adjoining vegetative communities under ideal climatic and environmental conditions. There was a report of it having invasive weedy characteristics in a pasture in Wyoming."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"It is very rarely invasive [7,78,119,156], typically occurring in small populations in only a few counties of the states in which it grows"
	Queensland Government. (2019). Weeds of Australia. <i>Sanguisorba minor</i> . http://keyserver.lucidcentral.org . [Accessed 24 Jan 2019]	"Sheep's burnet (<i>Sanguisorba minor</i> subsp. <i>muricata</i>) is regarded as a minor environmental weed in South Australia and Victoria, and as a potential environmental weed or "sleeper weed" in other parts of southern Australia."

305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	" <i>Sanguisorba officinalis</i> ... Weed of: Pastures" [Possibly Yes. Impacts unknown]

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. 1988. Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	[No evidence] "Herb with branching rhizomes; stems ± erect, up to 35-(70) cm tall at flowering, glabrous to sparingly pilose, sparingly branched, greenish yellow to purplish, grooved. Lower lvs in basal rosettes; petiole short; blade oblong to narrowly oblanceolate, up to 150-(300) × 45 mm, imparipinnate; leaflets in (5)-7-10-(12) pairs, shortly petiolulate or sessile, narrowly obovate to elliptic or orbicular, 5-12-(30) mm long, glabrous above, sparsely finely puberulent and often with a few longer hairs on veins beneath, deeply serrate, sometimes purplish especially towards margins or pale to ± glaucous below. Cauline lvs few, similar to basal lvs but with fewer and narrower leaflets. Infl. a dense globose head, elongating somewhat at fruiting. Sepals ovate oblong, (2)-3-4 mm long, free, ± emarginate with a small cusp, green; margins whitish or pink to purple. Stamens numerous. Hypanthium usually broadly ellipsoid, rarely ellipsoid at fruiting, glabrous, almost glabrous or pubescent, (2)-4-5 mm long, usually sharply angled and winged, rarely obscurely winged; faces usually reticulate and the ridges with small projections, rarely faintly reticulate. "

402	Allelopathic	n
	Source(s)	Notes
	Del Fabbro, C., Güsewell, S., & Prati, D. (2014). Allelopathic effects of three plant invaders on germination of native species: a field study. <i>Biological Invasions</i> , 16(5), 1035-1042	"In a field experiment, we investigated whether three plant species invasive in Europe, <i>Solidago gigantea</i> , <i>Impatiens glandulifera</i> and <i>Erigeron annuus</i> , inhibit the germination of native species through allelopathy more than an adjacent native plant community." [Sanguisorba minor and other species were evaluated to see if they were being affected by the allelopathic properties of the three invasive test species. Sanguisorba minor itself was not being evaluated for its own allelopathic properties]
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	[Intentionally sown pasture and range plant. No indication that species may be allelopathic] "Small burnet grows in grasslands and shrublands in Europe and is most common on the chalk grasslands in England. It is usually planted on rangelands in western North America including pinyon-juniper woodlands, ponderosa pine forests, dry quaking aspen parklands, mountain grasslands, chaparral, desert and mountain shrublands, and sagebrush steppe (Fryer, 2008)." ... "Small burnet is an introduced species and establishes and can spread relatively quickly via seed distribution. Generally, it is not considered "weedy" or an invasive species, but can spread into adjoining vegetative communities under ideal climatic and environmental conditions."

403	Parasitic	n
	Source(s)	Notes
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. 1988. Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Herb with branching rhizomes; stems ± erect, up to 35-(70) cm tall at flowering, glabrous to sparingly pilose, sparingly branched, greenish yellow to purplish, grooved." [Rosaceae. No evidence]

404	Unpalatable to grazing animals	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"Grazing/rangeland: Small burnet has good to excellent forage value for livestock and wildlife during all seasons. It stays green throughout the growing season and into winter until heavy snow cover occurs, providing forage and seed to livestock and wildlife."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 25 Jan 2019]	"Small burnet provides good wildlife forage. Elk, deer, pronghorn, eastern cottontails, and birds utilize the foliage and/or seeds [89,123,137], (McLain 1959, cited in [137])." ... "Livestock: Small burnet is planted in pastures and rangelands [49,120]. It provides high-value forage for livestock in general [157] and is especially valuable as domestic sheep forage [24,26]. Livestock use is generally highest in early spring, late fall, and winter, when other forage is sparse [127]." ... "Palatability/nutritional value: Small burnet has good to excellent forage value for wildlife and livestock in all seasons. It generally stays green and palatable throughout the growing season and into winter until heavy snows [26,119]. Small burnet is often added to rangeland seed mixes because it is so palatable to grazing wildlife [9]. Domestic sheep and mule deer prefer it, and small burnet is "very palatable" to ungulates in general [120]."

405	Toxic to animals	n
	Source(s)	Notes
	Gardenersworld.com. (2019). <i>Sanguisorba minor</i> . https://www.gardenersworld.com/plants/sanguisorba-minor/ . [Accessed 25 Jan 2019]	" <i>Sanguisorba minor</i> has no toxic effects reported."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 25 Jan 2019]	"Small burnet provides good wildlife forage. Elk, deer, pronghorn, eastern cottontails, and birds utilize the foliage and/or seeds [89,123,137], (McLain 1959, cited in [137])." ... "Livestock: Small burnet is planted in pastures and rangelands [49,120]. It provides high-value forage for livestock in general [157] and is especially valuable as domestic sheep forage [24,26]. Livestock use is generally highest in early spring, late fall, and winter, when other forage is sparse [127]." ... "Palatability/nutritional value: Small burnet has good to excellent forage value for wildlife and livestock in all seasons. It generally stays green and palatable throughout the growing season and into winter until heavy snows [26,119]. Small burnet is often added to rangeland seed mixes because it is so palatable to grazing wildlife [9]. Domestic sheep and mule deer prefer it, and small burnet is "very palatable" to ungulates in general [120]."
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	n
	Source(s)	Notes

Qsn #	Question	Answer
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"Disease problems are minimal with small burnet. Damage from wildlife and rodents may occur and they may need to be controlled."
	Missouri Botanical Garden. (2019). <i>Sanguisorba minor</i> . http://www.missouribotanicalgarden.org . [Accessed 24 Jan 2019]	"Problems - No serious insect or disease problems."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Prance, G. & Nesbitt, M. (2005). <i>The Cultural History of Plants</i> . Routledge, New York, NY	"Today it is cultivated sporadically in Europe, including Britain, Germany, and France, and in North America and Asia. The leaves have a pleasant cucumber flavor and have been eaten since classical Greek times and were commonly used in salads from the 15th to 19th centuries. In recent times they have been used as ensalada italiana in Spain, especially in Catalonia. The leaves are also added to cold drinks in the same way as the better-known borage. The upper parts of the plant and its roots have been used in folk medicine for digestive disorders. In arid areas it is occasionally cultivated as fodder for sheep."
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: <i>Fire Effects Information System</i> , [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 25 Jan 2019]	[May reduce fire risk. Planted in green fuelbreaks] "Fuels: Small burnet leaves stay green and maintain a relatively high moisture content in the fire season [119]. Monsen [79] rates small burnet foliage as moderately flammable and its litter as low in flammability. Because of its high moisture content, small burnet is often seeded onto greenstrip fuelbreaks [79,93,94] "

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Missouri Botanical Garden. (2019). <i>Sanguisorba minor</i> . http://www.missouribotanicalgarden.org . [Accessed 24 Jan 2019]	"Easily grown in average, medium, well-drained soils in full sun."
	L&H Seeds. (2019). <i>Sanguisorba minor*</i> (Small burnet). http://www.lhseeds.com/sanguisorba-minor-small-burnet/ . [Accessed 25 Jan 2019]	"Shade Tolerance: Intermediate"
	Gardenersworld.com. (2019). <i>Sanguisorba minor</i> . https://www.gardenersworld.com/plants/sanguisorba-minor/ . [Accessed 25 Jan 2019]	"Sun exposure: Full sun, dappled shade"

Qsn #	Question	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Missouri Botanical Garden. (2019). <i>Sanguisorba minor</i> . http://www.missouribotanicalgarden.org . [Accessed 24 Jan 2019]	"Easily grown in average, medium, well-drained soils in full sun."
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"In Europe, small burnet is restricted to calcareous soils but is not restricted by soil type or texture in North America (Fryer, 2008). In North America, small burnet grows on relatively infertile, well drained soils and is most productive on silty or loamy soils with annual precipitation of 14 inches or greater. It will establish but not persist on drier sites (down to 12 inches annual precipitation) or shaded or poorly drained soils (Ogle, 2011a). It is adapted to a broad range of elevation from 100 feet above sea level in California to 8,900 feet in the Intermountain West (Fryer, 2008)."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Soils: Small burnet accessions in North America are adapted to relatively infertile, well-drained soils [120,157]. Small burnet is most productive on slightly acidic to mildly alkaline soils [119,156], although small burnet tolerates soils up to 8.0 in pH [51]. It also tolerates mildly saline soils [89]."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. 1988. Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Herb with branching rhizomes; stems ± erect, up to 35-(70) cm tall at flowering, glabrous to sparingly pilose, sparingly branched, greenish yellow to purplish, grooved."

412	Forms dense thickets	
	Source(s)	Notes
	Stevens, R., & Monsen, S. B. (2004). Forbs for seeding range and wildlife habitats. Pp. 425-466 In: Monsen, S. B.; Stevens, R.; Shaw, N. L. Restoring Western Ranges and Wildlands, vol. 2. Gen. Tech. Rep. RMRS-GTR-136-vol-2. USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO	"Where seeds are allowed to mature and rodent and rabbit populations are low, reproduction will take place. Dense stands of small burnet have remained in some seedings for as long as 25 years." [Cultivated dense stands persist. Ability to exclude other vegetation unspecified]

501	Aquatic	n
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	[Terrestrial] "Small burnet grows in grasslands and shrublands in Europe." ... "Small burnet is most common on western rangelands in North America."

502	Grass	n
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Qsn #	Question	Answer
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 24 Jan 2019]	Family: Rosaceae Subfamily: Rosoideae Tribe: Agrimonieae Subtribe: Sanguisorbinae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 24 Jan 2019]	Family: Rosaceae Subfamily: Rosoideae Tribe: Agrimonieae Subtribe: Sanguisorbinae [Sanguisorba not among the N-fixing genera of Rosaceae]

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	[With a deep taproot and rhizomes, but no bulbs, corms or tubers] "The stem base ends in a usually branched caudex, with a long, stout taproot beneath [18,42,89,119,120,127]. Roots of plants in southern England were estimated at more than 16 inches (40 cm) in length [11], while small burnet roots in New Zealand were traced to 3-foot (1 m) depths [117]. Small burnet sometimes has short rhizomes [42,64,115,116,119]."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	[No evidence. Widespread distribution] "Small burnet is native to Europe, western Asia and Siberia, and northern Africa [41,109,112]. It is nonnative in North America, South America, Australia, and New Zealand. Most North American small burnet populations originated in Europe [49,50,89,132,155]. A few small burnet accessions came from the Middle East [127]. Small burnet was deliberately introduced as a pasture and rehabilitation forb. It is very rarely invasive [7,78,119,156], typically occurring in small populations in only a few counties of the states in which it grows (for example, see [74,78,101,132]). In western North America, small burnet occurs sporadically from British Columbia east to Montana and south to California, New Mexico, and Nebraska [18,60,64]. It is also sporadically distributed to the east [42,110] from Ontario east to Nova Scotia and south to Tennessee and North Carolina [60,110]. Plants Database provides a distributional map of small burnet. "

602	Produces viable seed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Missouri Botanical Garden. (2019). <i>Sanguisorba minor</i> . http://www.missouribotanicalgarden.org . [Accessed 24 Jan 2019]	"Freely self-seeds. Remove flower stalks immediately after bloom unless self-seeding is desired."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Small burnet establishes from seed [127,156] and by sprouting from the caudex [79,117]. Some plants may sprout from rhizomes [115,116]." ... "Small burnet produces seed prolifically on mesic sites [120]. In dryland pastures on the San Juan Basin Research Center, Colorado, small burnet was the highest seed producer among 11 species tested. Across 3 years, mean small burnet seed production ranged from 623 to 1,307 seeds/3 m ² [39]. Small burnet generally does not reproduce in the most xeric areas of the Great Basin [128]."

603	Hybridizes naturally	
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"The subspecies can hybridize [29,87]." [Unknown if interspecific hybridization is possible]

604	Self-compatible or apomictic	y
	Source(s)	Notes
	Dickinson, T. A., Lo, E., & Talent, N. (2007). Polyploidy, reproductive biology, and Rosaceae: understanding evolution and making classifications. <i>Plant systematics and evolution</i> , 266(1-2), 59-78	"Although <i>Sanguisorba</i> L. comprises a diploid and several polyploid species (Mishima et al. 2002), embryological data documenting gametophytic apomixis are available only for the herbaceous perennial <i>Sanguisorba minor</i> Scop. (Johri et al. 1992), in which tetraploids and octoploids are found."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Small burnet is monoecious [109]. Rarely, it is also apomictic [87,109]."

Qsn #	Question	Answer
605	Requires specialist pollinators	n
	Source(s)	Notes
	Dickinson, T. A., Lo, E., & Talent, N. (2007). Polyploidy, reproductive biology, and Rosaceae: understanding evolution and making classifications. <i>Plant systematics and evolution</i> , 266(1-2), 59-78	"Although <i>Sanguisorba</i> L. comprises a diploid and several polyploid species (Mishima et al. 2002), embryological data documenting gametophytic apomixis are available only for the herbaceous perennial <i>Sanguisorba minor</i> Scop. (Johri et al. 1992), in which tetraploids and octoploids are found."
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Pollination: Small burnet is pollinated by bees"

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. 1988. <i>Flora of New Zealand</i> Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"Herb with branching rhizomes; stems ± erect, up to 35-(70) cm tall at flowering"
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Vegetative regeneration: Small burnet sprouts from the caudex [79,117]. Some plants also sprout from rhizomes [109,115,116,119], but rhizomes are short [116,119], so clonal expansion of small burnet is limited [119]."

607	Minimum generative time (years)	2
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Flower and seed production: Small burnet first flowers and sets seed at 2 years of age [124]."
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. <i>Plant Guide for Small Burnet (Sanguisorba minor)</i> . USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"Germination normally occurs the first growing season if adequate moisture is available. Full flowering should not be expected until at least the second growing season."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	Andrabi, S. M., Rehman, W., Reshi, Z. A., Naqshi, A. R., & Ganie, A. H. (2012). <i>Sanguisorba minor</i> Scop. (Rosaceae), A New Addition to the Indian Flora. <i>Taiwania</i> , 57(4), 410-412	"The species has presumably come to our area with the luggage of tourists as this area is a world famous tourist destination." [Inadvertent human dispersal suspected]

Qsn #	Question	Answer
702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 25 Jan 2019]	[Widely introduced] "Small burnet is native to Europe, western Asia and Siberia, and northern Africa [41,109,112]. It is nonnative in North America, South America, Australia, and New Zealand. Most North American small burnet populations originated in Europe [49,50,89,132,155]."

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Webb, C. J., Sykes, W. R., & Garnock-Jones, P. J. 1988. Flora of New Zealand Volume IV. Botany Division, DSIR, Christchurch, New Zealand	"S. minor may have entered N.Z. as a seed contaminant."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Sanguisorba minor ... Major Pathway/s: Contaminant, Crop, Herbal, Ornamental, Pasture"
	Thompson, B. H. (1996). Lismore flora: flowering plants and ferns. Glasgow Naturalist, 23(1), 14-40	"Sanguisorba minor Salad Burnet 3 Two plants at entrance to Killlean Farm. Presumed introduction with wildflower seed."

704	Propagules adapted to wind dispersal	
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 25 Jan 2019]	[Possibly] "Seed dispersal: Small burnet seed remains in the hypanthium when dispersed. Hypanthia are dispersed by animals, and possibly by wind and water. In the Great Basin, small burnet has established from unretreived seed in rodent caches [127]."

705	Propagules water dispersed	
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	[Possibly Yes] "Seed dispersal: Small burnet seed remains in the hypanthium when dispersed. Hypanthia are dispersed by animals, and possibly by wind and water. In the Great Basin, small burnet has established from unretreived seed in rodent caches [127]. The wings on most small burnet hypanthia may facilitate wind and/or water dispersal; speculation on the function of the wings was not found in the literature. In a study of flooded meadow communities in France, small burnet was present in soil seed banks on riverbanks subjected to periodic, short-term floods [147]. Small burnet is reported mostly from shorelines in Michigan [149]. These studies raise the possibility that water disperses small burnet hypanthia."

706	Propagules bird dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 25 Jan 2019]	[Birds are seed predators. Unknown if any survive predation] "Small burnet seed is palatable to granivorous rodents, lagomorphs, and upland game birds."
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	[Birds consume seeds as a food source, and are primarily seed predators. Unknown if any survive consumption] "Small burnet is considered very desirable forage for elk, deer, antelope and birds either as herbage or seed. Birds use the seed in fall, winter and spring."

707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	[Dispersed externally by rodent seed predators] "Seed dispersal: Small burnet seed remains in the hypanthium when dispersed. Hypanthia are dispersed by animals, and possibly by wind and water. In the Great Basin, small burnet has established from unretreived seed in rodent caches [127]."

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Malo, J. E., & Suárez, F. (1995). Herbivorous mammals as seed dispersers in a Mediterranean dehesa. <i>Oecologia</i> , 104(2), 246-255	"Species belonging to the 99 most-frequent species list (De Miguel 1988) which were absent from dung samples" [<i>Sanguisorba minor</i> among this list of species absent from dung samples]
	Fazelian, S., Kohyani, P. T., & Shirmardi, H. A. (2014). Endozoochorous seed dispersal of plant species in semi-steppe rangelands. <i>International Journal of Advanced Biological and Biomedical Research</i> , 2(2), 473-486	[Seeds passed through goats and sheep did not germinate] "Species of <i>Trigonella elliptica</i> , <i>Nigella sativa</i> and <i>Sanguisorba minor</i> germination just for control treatment were able to germinate, that there was no clear relationship between seed characteristics and pass through the digestive system"
	Bonn, S. (2005). Dispersal of plants in the Central European landscape-dispersal processes and assessment of dispersal potential exemplified for endozoochory. PhD Dissertation. University of Regensburg	[Survives gut passage through cattle] "Despite similar mean numbers of germinated seedlings in sheep and cattle dung, there was a big variance between individual animals and among plant species. Regarding the fed plant species, significant differences in diaspore survival after passing the gut of cattle and sheep were found for five species (Table 4.6): <i>Plantago media</i> , <i>Thymus pulegioides</i> ($p < 0.01$), <i>Hieracium pilosella</i> and <i>Salvia pratensis</i> ($p < 0.05$) survived the passage of the sheep gut better, whereas <i>Sanguisorba minor</i> survived the passage of cattle's digestive tract in higher rates ($p < 0.01$)." ... "In contrast to sheep dung, seedlings of <i>Sanguisorba minor</i> were found in relatively high quantities in the exposed cattle dung."

801	Prolific seed production (>1000/m ²)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed]	[Prolific seed production, but not in excess of 1000 seeds/m ²] "Small burnet produces seed prolifically on mesic sites [120]. In dryland pastures on the San Juan Basin Research Center, Colorado, small burnet was the highest seed producer among 11 species tested. Across 3 years, mean small burnet seed production ranged from 623 to 1,307 seeds/3 m ² [39]. Small burnet generally does not reproduce in the most xeric areas of the Great Basin [128]."

802	Evidence that a persistent propagule bank is formed (>1 yr)	y
	Source(s)	Notes
	Fryer, J. L. 2008. <i>Sanguisorba minor</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html . [Accessed 24 Jan 2019]	"Seed banking: Small burnet has a persistent soil seed bank [67,99,141,147,147]. Studies in northwestern Europe found viable small burnet seed persisted for at least 30 years in the soil. Mean small burnet seed density was 24 seeds/m ² ; mean burial depth was 4 inches (10 cm) (review by [136]). In greenhouse studies in Italy, small burnet germinants showed 63% frequency in soil samples collected from grassland. In soil samples collected on former grassland sites converted to cedar (<i>Cedrus deodora</i> , <i>C. atlantica</i>) plantations 26 years before the study, small burnet germinants had 20% and 40% frequency in soils collected from plantations with respectively "sparse" and "dense" cedar plantings [72]."

803	Well controlled by herbicides	y
	Source(s)	Notes
	Ogle, D., St. John, L., and Peterson J. (Ed.). 2013. Plant Guide for Small Burnet (<i>Sanguisorba minor</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, Idaho	"To control small burnet in a pasture use a tank mix of Escort®, Banvel®, 2,4-D and a surfactant. The addition of 2,4-D may make the mix hot enough to kill the burnet. A mix of Stinger® (0.5-1.5 pt) and 2,4-D (1-2 pt) could also be used. Another suggestion is application of Tordon®, but only as a last resort (Hutchinson, personal communication)."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes

Qsn #	Question	Answer
	<p>Fryer, J. L. 2008. <i>Sanguisorba minor</i>. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. https://www.fs.fed.us/database/feis/plants/forb/sanmin/all.html. [Accessed 25 Jan 2019]</p>	<p>[Regrows after grazing] "Small burnet tolerates moderate grazing [152], showing good compensatory growth in response to moderate utilization. Small burnet regrowth after domestic sheep grazing in New Zealand was termed "splendid" (review by [29]). In a New Zealand pasture, small burnet showed mean regrowth rates of 46 kg dm/ha/day after 3 repeated domestic sheep defoliations down to 2.8- to 3.2-inch (7-8 cm) heights [26]. Small burnet typically tolerates severe grazing as long as grazing is not continuous [29]." ... [Possibly resprouts after fires] "Small burnet response to fire is not well documented. Since it is known to sprout from a thick caudex [79,117] that is attached to a large, storage taproot [18,42,89,119,120,127], sprouting is likely important to small burnet's postfire recovery. Rhizomatous plants may also sprout from the rhizomes after fire. Monsen [79] rates small burnet's sprouting ability as "good". Barnes [144] collected a small burnet plant that had sprouted from the caudex and produced a single flowerhead the year following fire in a pinyon-juniper community in the Beaver Dam Mountains of Utah."</p>

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, and able to grow in 5 hardiness zones, demonstrating environmental versatility
- Certain subspecies can grow in subtropical climates, but primarily a temperate to Mediterranean species
- Naturalized in many countries, but no evidence in Hawaiian Islands to date
- Regarded as weedy, and potentially impacting the natural environment, but generally considered a desirable pasture plant
- Tolerates many soil types
- Reproduces by seeds and vegetatively by rhizomes (short distances)
- Apomictic forms exist
- Reaches maturity in 2 years
- Seeds dispersed by internally and externally by animals, intentionally by people, as a seed contaminant, and potentially by wind and water
- Prolific seed production (but not in excess of 1000 seeds/m²)
- Seeds persist in soil for 30+ years
- Able to resprout after browsing; may also tolerate some fire

Low Risk Traits

- Despite reports of weediness, generally regarded as a desirable, non-aggressive pasture addition
- Unarmed (no spines, thorns, or burrs)
- Provides fodder for livestock
- Non-toxic
- May be limited to high light environments
- Herbicides may provide effective control