Keywords: High Risk, Noxious Weed, N-fixing shrub, Thicket-forming, Ballistic dispersal

Family: ***Fabaceae***

Taxon: ***Genista monspessulana***

Synonym: *Cytisus candicans (L.) DC.*
Cytisus monspessulanus L.
Genista candicans L.
Teline monspessulana (L.) K.Koch

Common Name: Canary broom
cape broom
French broom
Montpellier broom
soft broom

Questionaire : current 20090513 **Assessor:** Assessor **Designation:** H(HPWRA)
Status: Assessor Approved **Data Entry Person:** Assessor **WRA Score 15**

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	
103	**Does the species have weedy races?**	**y=1, n=-1**	
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)**	**Low**
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**	**n**
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)**	**n**
303	**Agricultural/forestry/horticultural weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
304	**Environmental weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
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**	**y=1, n=0**	
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**	
406	**Host for recognized pests and pathogens**	**y=1, n=0**	
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**	
409	**Is a shade tolerant plant at some stage of its life cycle**	**y=1, n=0**	**y**

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**	**y**
501	**Aquatic**	**y=5, n=0**	**n**
502	**Grass**	**y=1, n=0**	**n**
503	**Nitrogen fixing woody plant**	**y=1, n=0**	**y**
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**	**y=1, n=-1**	
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**	**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**	**y**
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**	**y=1, n=-1**	**n**
705	**Propagules water dispersed**	**y=1, n=-1**	**y**
706	**Propagules bird dispersed**	**y=1, n=-1**	**y**
707	**Propagules dispersed by other animals (externally)**	**y=1, n=-1**	**y**
708	**Propagules survive passage through the gut**	**y=1, n=-1**	
801	**Prolific seed production (>1000/m2)**	**y=1, n=-1**	**y**
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)**	**y=-1, n=1**	

Designation: H(HPWRA) **WRA Score** **15**

Supporting Data:

101	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Is the species highly domesticated? No] No evidence
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Species suited to tropical or subtropical climate(s) 0-Low] "In its native range, G. monspessulana is most abundant in the coastal and sub montane slopes of the Atlas Mountains in Morocco and Algeria, southwest Corsica, France (where it co-occurs with Cytisus scoparius) and in northwest Catalonia (Spain and France). Other significant native areas for this species are France (Massif des Maures and les Cevennes), Italy (Catena Costiera and Aspromonte; Sicily in Monti Nebrodi and Madonie; Sardinia in Monte Ortobene, Nuoro), Albania, Greece (Ilía - western Peloponissos), certain eastern Aegean Islands (e.g. Rhodes), Portugal (Estremadura, western Lisboa), Spain (southwestern Andalucia) and Turkey (southern coastal Mediterranean slopes) (Gibbs and Dingwall, 1971; Sheppard, 2003; Sheppard and Thomann, 2004)."
202	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Quality of climate match data 2-High]
203	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Broad climate suitability (environmental versatility)? Yes. Exhibits environmental versatility] "In exotic communities, G. monspessulana appears less restricted by habitat type and soil pH. It has become a major widespread weed in native and commercial forest ecosystems, in disturbed habitats, and along water courses. Invaded habitats include sclerophyllous recreational and commercial forests, open woodland, along roadsides, railways and river systems from 0-1000 m altitude, coastal plains, mountain slopes, riverbanks, road cuts, forest clear-cuts, grassland and open canopy forest." … "G. monspessulana can be found at up to ca. 1000 m altitude. Altitudinal and latitudinal limits are set by persistent low winter temperatures and rainfall on seedling survival (González Andrés and Ortiz, 1996a). It is also poorly adapted to consistently cold temperate winters, showing little capacity to shut down growth over winter. In a Mediterranean climate, however, it will quickly overtop more winter dormant temperate species, like C. scoparius, because it can grow as soon as conditions are suitable such as during warm weeks in winter."
204	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Native or naturalized in regions with tropical or subtropical climates? No. Invasive in areas with temperate and Mediterranean climates]
205	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Does the species have a history of repeated introductions outside its natural range? Yes] "It its exotic range, G. monspessulana is present in a number of countries surrounding the native distribution (Syria, the Caucasus, the Azores and Armenia; Gibbs and Dingwall, 1971; ILIDIS, 2004). It is also present in North and South America, South Africa and Australasia."
205	2013. Starr, F./Starr, K.. Plants of Hawaii - Genista monspessulana. http://www.starrenvironmental.com/images/species/?q=genista+monspessulana&o=plants [Accessed 15 Oct 2013]	[Does the species have a history of repeated introductions outside its natural range? Maui] "Genista monspessulana (French broom) Flowers and leaves at Upper Kimo Dr Kula, Maui. June 21, 2007"
301	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand http://FloraSeries.LandcareResearch.co.nz	[Naturalized beyond native range? Yes] "N.: locally common throughout; S.: locally common throughout except Westland." … "Waste places, scrubland. " [Listed as synonym Teline monspessulana]
302	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Garden/amenity/disturbance weed? A disturbance adapted weed with negative impacts to forestry and natural areas] "In exotic communities, G. monspessulana appears less restricted by habitat type and soil pH. It has become a major widespread weed in native and commercial forest ecosystems, in disturbed habitats, and along water courses."

302	2013. Geerts, S./Botha, P.W./Visser, V./Richardson, D.M./Wilson, J. R.. Montpellier broom (Genista monspessulana) and Spanish broom (Spartium junceum) in South Africa: An assessment of invasiveness and options for management. South African Journal of Bota	[Garden/amenity/disturbance weed? A disturbance adapted weed with negative impacts to forestry and natural areas] "G. monspessulana occurs at nine localities in three quarter-degree cells, covering a total of 22.7 ha." … "All naturalised or invasive populations are in disturbed areas, mostly along roadsides."
303	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Agricultural/forestry/horticultural weed? Yes] "Since it grows more rapidly than most trees used in forestry, it shades out tree seedlings in areas that are revegetated after harvest and makes reforestation difficult [11]."
303	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Agricultural/forestry/horticultural weed? Yes] "It also poses direct costs to the Forestry Industry (D McGuire, Forestry South Australia, Meadows, Australia, personal communication, 2005)." … "G. monspessulana is a significant weed of forestry, particularly in pine and eucalypt plantations, where it either smothers planted saplings and reduces their growth or prevents natural regeneration. In native woodland situations (e.g. Californian redwood forests, USA), it can reduce natural regeneration by shading. Natural regeneration in woodland can be reduced following the hotter natural fires which result from the higher fuel load provided by the infestation."
303	2013. Queensland Government. Weeds of Australia - Cape broom - Genista monspessulana. http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Genista_monspessulana.htm [Accessed 15 Oct 2013]	[Agricultural/forestry/horticultural weed? Yes] "Cape broom (Genista monspessulana) smothers desirable vegetation in pastures, which causes a reduction in stocking rates in infested areas. In fact, it is considered to be a significant weed of semi-improved pastures along the coast and on the tablelands in New South Wales. This species also forms dense thickets which can block access by humans and livestock, and harbour feral animals such as rabbits, foxes and wild pigs. Its seeds are poisonous to humans and livestock. "
304	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Environmental weed? Yes] "Impacts: French broom is listed by the California Invasive Plant Council as one of the most widespread and invasive wildland pest plants in California [16]. Several reviews suggest that French broom invades native vegetation, displaces native plant and forage species, and dominates the invaded community, sometimes forming dense, monospecific, almost impenetrable stands [11,43,57]. Experimental evidence indicates that French broom invasion causes changes in plant community composition by displacing vegetation and decreasing local native plant alpha diversity [49]. A comparison of 12 "old-growth" French broom plots and 12 uninfested California grassland plots indicates that the number of native species (11.7 species + 0.8 s x, versus 3.1 + 0.3) and cover (15.1 + 5.0% versus 5.1 + 1.7%) are higher in plots where broom is absent [49]. A study of seed banks in California grassland indicates a decrease in seed banks of native species in invaded stands, even in French broom stands as young as 5 years [3]."
304	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Environmental weed? Yes] "In its introduced range, however, it is an invasive environmental weed of national, state and urban parks and fallow land, often forming dense monospecific stands. It is listed as a controlled weed in Australia and California, USA." … "In Australia, it is a widespread environmental weed of national, state and urban parks and fallow land mainly in South Australia and Victoria, but also in Tasmania and southern New South Wales (Sheppard, 2000). It has been estimated to invade at least 600,000 ha in Australia. In South Australia and Victoria it is classed as a noxious weed, while in Tasmania it is a 'secondary weed'. In South Australia it is widespread but with large infestations in the Mount Lofty Ranges, Belair National Park and the Clare Valley (Crossman and Kochergen, 2002)." … "In the USA, G. monspessulana is a widespread environmental weed of national, state and urban parks and fallow land, mainly in central California and southern Oregon (Jepson, 1979). In California it has been estimated to invade at least 40,000 ha and was first introduced as an ornamental into the San Francisco Bay region. It is classed as an A-1 weed by CalEPPC (California Exotic Pest Plant Council) and a class C weed by the Californian Department of Food and Agriculture. It is particularly prevalent along the coast from Monterey county north to Mendicino county and inland in Lake Solano and Contra costa counties and also in the Sierra Nevada foothill counties to 800 m (Bossard, 2000)."
304	2013. USDA Natural Resources Conservation Service. Hawaii State-listed Noxious Weeds. http://plants.usda.gov/java/noxious?rptType=State&statefips=15	[Environmental weed? Hawaii state noxious weed]

305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Congeneric weed? Yes] "Genista linifolia" … "Where invasive, it forms dense thickets that displace native vegetation and prevent regeneration of native herbs and shrubs."
401	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Produces spines, thorns or burrs? No] "G. monspessulana is an unarmed leafy leguminous shrub, usually with one stem branching into ascendant, spreading and ridged (but not 5 sided) green stems covered with short soft hairs (Gibbs and Dingwall, 1971; Jepson, 1979). The main stem is grey and hairless and ridges reduce with age. Plants grow to 3 m. Leaves are alternate, three-foliate and petiolate (2-4 mm long). Leaflets are elliptic to obovate, 5-20 x 2.2-15 mm, often with a short point or mucro (0-0.3 mm long), upper surface virtually hairless, lower surface of leaflets varying from scattered hairs to softly hairy with hairs often more common along the midrib. Stipules 0.5-1.5 mm not persisting or prominent."
402	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Allelopathic? Unknown] Not documented among impacts
403	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Parasitic? No] "French broom is an upright, evergreen shrub, commonly less than 10 feet (3 m) tall, occasionally to 16 feet (5 m) tall. Stems are erect, dense, and green and densely covered with silky, silvery hairs. French broom is typically leafy (as compared with Scotch broom, which has few leaves), with compound, deciduous leaves with leaflets 0.4 to 0.8 inch (10-20 mm) long and petioles 5 mm long. " [Fabaceae]
404	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Unpalatable to grazing animals? No. Palatable to goats, but not cattle] "As of this writing (2005) no information is available on the use of French broom by livestock or wildlife. However, it is probably eaten by domestic goats, and goat grazing is used to control broom species in New Zealand [39] and California [64] (see Biological Control). Cattle do not eat broom [39]. "
404	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Unpalatable to grazing animals? No] "In the native range, G. monspessulana suffers high levels of herbivory from goats, stem miners, insects in seedpods and post dispersal seed predation by rodents (J Lloyd, Weeds CRC, University of Adelaide, Australia, unpublished data)."
405	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[Toxic to animals? Possibly] "Cape broom is believed to be toxic if grazed excessively but this is not considered a problem in Australia, even though sheep readily eat young plants."
405	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Toxic to animals? Yes] "According to Hickman [35], French broom flowers, and perhaps all parts, are toxic. French broom foliage and seeds contain a variety of quinolizidine alkaloids, especially in young leaves. In some livestock, ingestion of plant parts can cause staggering followed by paralysis. French broom foliage can cause digestive disorders in horses ([11], and references therein)."
406	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Host for recognized pests and pathogens? Unknown. None reported]
407	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Causes allergies or is otherwise toxic to humans? No. Humans do not ingest the plant] "According to Hickman [35], French broom flowers, and perhaps all parts, are toxic. French broom foliage and seeds contain a variety of quinolizidine alkaloids, especially in young leaves. In some livestock, ingestion of plant parts can cause staggering followed by paralysis. French broom foliage can cause digestive disorders in horses ([11], and references therein)."
408	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[Creates a fire hazard in natural ecosystems? Possibly] "Cape broom causes concern in forest areas by forming an inflammable understorey at the edge of forests where fires are most likely to start."

408	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Creates a fire hazard in natural ecosystems? Possibly] "Fuels/flammability: A review by Bossard [11] suggests that French broom burns readily and carries fire to the tree canopy layer, increasing both the frequency and intensity of fires in invaded areas. Similarly, Parsons and Cuthbertson [54] suggest that French broom causes concern in forest areas in Australia because it forms a flammable understory at the forest edge, where fires are most likely to start. Conversely, combustion of live, standing broom is difficult under conditions in which prescribed burns are typically conducted in California (cool, wet, low wind days that provide lower risk of an escaped fire), unless fuel loads are artificially increased. Despite high temperatures and low humidities, researchers in Marin County, California were unable to burn a mature, uncut French broom stand, and a young uncut stand had only spotty combustion [49]." … "While it has been suggested that French broom invasion increases fire hazard (e.g. [11,54]), this relationship may be site-specific, as others authors (e.g. [49]) indicate that French broom is difficult to burn"
409	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Seedlings are fairly shade tolerant." … "Montpellier broom is quite tolerant of heavy shade as it persists as an understorey plant at least in forest gaps and trails even with quite dense canopy cover. Seedlings can tolerate up to 80% shade (C Bossard, St Mary's College, Moraga, California, USA, unpublished data) allowing broom to persist in woodland and forests."
410	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Tolerates a wide range of soil conditions ? Yes] "In California, French broom occurs on sites with varied soil moisture conditions, but seems to prefer siliceous soils. Unlike other broom species in California, it grows reasonably well on alkaline soils with pH 8. Its ability to fix nitrogen allows growth in low fertility soils [11]."
410	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Tolerates a wide range of soil conditions? Yes] "Invaded habitats include coastal plains, mountain slopes, riverbanks, road cuts, forest clear-cuts, grassland and open canopy forest on a wide range of soil types." … "In its native range, broom is a calcifuge (Polunin and Smythies, 1973). In the exotic range, however, this broom occurs on a broader range of soils derived from a wide variety of substrates, particularly river sand, schist, granite, basalt or siliceous soils, and can even grow reasonably well on alkaline soils up to pH 8 (González-Andrés and Ortiz , 1996b). It does not flourish on calcareous soils."
411	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand http://FloraSeries.LandcareResearch.co.nz	[Climbing or smothering growth habit? No] "Much-branched, usually evergreen shrub up to 2.5 m high; twigs villous, particularly when young, round and ribbed. Leaves usually sparsely to densely clothed in appressed hairs on both surfaces, sometimes subglabrous above, petiolate, 3-foliolate; leaflets shortly petiolulate, obovate, acute to obtuse and shortly mucronate, 7-20-(30) x (3)-4-10-(12) mm; terminal leaflet larger than lateral leaflets; stipules triangular to lanceolate, up to 2.5 mm long."
412	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Forms dense thickets? Yes] "It forms extensive and dense thickets where invasive that displace native plant and forage species."
501	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Aquatic? No] "French broom is common in disturbed places such as riverbanks, road cuts, logged or burned areas, pastures, and road and utility rights-of-way [11,35]. It often occurs on steep and exposed slopes [53]."
502	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] Fabaceae
503	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Nitrogen fixing woody plant? Yes] "G. monspessulana is associated with specific nitrogen-fixing bacteria of the genus Bradyrhizobium (González-Andrés and Ortiz, 1999). Bacterial associations in root nodules allow this plant to grow faster survive better and have higher nitrogen content assisting competition and invasion on nitrogen-poor soils."
504	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand http://FloraSeries.LandcareResearch.co.nz	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Much-branched, usually evergreen shrub up to 2.5 m high; twigs villous, particularly when young, round and ribbed."

601	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Evidence of substantial reproductive failure in native habitat? No] "In its native range in the Mediterranean region, G. monspessulana is widespread but only locally abundant. It tends to form small populations."
602	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Produces viable seed? Yes] "French broom becomes reproductive at 2 to 3 years of age, or on reaching a height of about 1.5 to 2 feet (45-60 cm) [1,11]. A medium sized shrub can produce over 8,000 seeds a year (Bossard, unpublished data, cited by [11]). Adams and Simmons [1] found an average of 7,400 pods per bush, with an average of 4.8 seeds per pod, and 5% of the pods damaged by insects in a dense infestation of French broom in dry sclerophyll vegetation in Victoria, Australia."
602	2011. Herrera, A.M. et al.. Introduced populations of Genista monspessulana (French broom) are more dense & produce a greater seed rain in California, USA, than native populations in the Mediterranean Basin of Europe. Biological Invasions. 13(2): 369-380.	[Produces viable seed? Yes] "Results from this study have shown that G. monspessulana populations in California are characterized by higher density and taller plants, with higher seedling recruitment, and larger seed rain and seed bank densities."
603	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Hybridizes naturally? Hybrid cultivars exist] "Genista stenopetala (leafy broom) and particularly G. canariensis (Canary broom) are often confused with G. monspessulana in the exotic range and, as such, their common names are confused. Because the origin of most alien infestations is from horticultural stock where hybridization has frequently been practised and may occur further in the field (D Cooke, Department of Water, Land and Biodiversity Conservation, Adelaide, Australia, personal communication, 2005), confusion regarding clear identification is compounded." … "Several commercially available broom varieties are of hybrid stock, e.g. Cytisus 'Porlock' is considered to be a hybrid between G. monspessulana and Cytisus x spachianus sensu hort. Cytisus x spachianus has a range of varietal names (Cytisus racemosus Hort, Cytisus 'Racemosus Nana', Cytisus praecox 'Nana', Cytisus 'Racemosus Scoparius Nanus', Genista racemosa Hort, Genista hispanica sensu Macoboy, and Genista x spachiana) and is considered to be a hybrid between G. canariensis and G. stenopetala (Rowell, 1991; Atkinson and Sheppard, 2000) and has also naturalized in some areas (Parsons and Cuthbertson, 1992)."
604	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Self-compatible or apomictic? Yes] "Flowers can self pollinate, but the fertilization rate is 50% lower with autogamous pollen and successful fertilization requires that the flowers are tripped by a pollinator (Parker and Haubensak, 2002). Flower abortion rate in exotic stands varies from 70 to 95% and this could be only partially explained by pollen limitation, suggesting resources were the main factor limiting seed production (Parker and Haubensak, 2002)."
605	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Requires specialist pollinators? No. Honeybees] "Pollination: Both native and nonnative insects pollinate French broom. Parker and others [51,53] demonstrated pollinator limitation in French broom, underscoring the potential importance of pollinators to its fecundity and spread. Patterns of fecundity were not, however, strongly predicted by differences in pollen limitation between species (French and Scotch broom) or between sites [53]. Because nonnative honeybees are often the most common pollinators of brooms [52,72], potential negative impacts of beekeeping on broom management have been suggested [52]."
606	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Reproduction by vegetative fragmentation? No] "G. monspessulana reproduces only by seed from the second year and twice a year when young. Age structures in the native range are mostly bell shaped with age classes of 2 4 years dominant, few new recruits and few older plants (Lloyd, 2000)." … "All movement and spread of G. monspessulana occurs through the movement of seeds. Most widespread movement is considered to have occurred rapidly due to poor human practice (Bossard et al., 1995)."
607	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Minimum generative time (years)? 2+] "It is a fast-growing shrub that becomes reproductive within 2-3 years"
701	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] "Nowadays, most dispersal is through seed movement by road graders and earth-moving equipment, particularly in forest areas."
701	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] "Seed dispersal: French broom pods burst open explosively, ejecting seeds up to 13 feet (4 m). Seeds are further dispersed by ants, birds, and other animals and in river water, rain wash, and mud, and by vehicles and machinery [1,11]."

702	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Propagules dispersed intentionally by people? Yes] "As G. monspessulana is an important horticultural species, risks remain for significant further spread both through fresh introductions into countries associated with uninformed horticultural practices and illicit passage of seeds through the post."
703	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[Propagules likely to disperse as a produce contaminant? Yes] "Seed can also contaminate agricultural products, farm machinery, mud etc."
704	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Propagules adapted to wind dispersal? No] "Seed dispersal: French broom pods burst open explosively, ejecting seeds up to 13 feet (4 m). Seeds are further dispersed by ants, birds, and other animals and in river water, rain wash, and mud, and by vehicles and machinery [1,11]."
705	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Propagules water dispersed? Yes] "Several cases of broom spread have resulted from movement from the top of water catchments, down river systems and out into the surrounding landscape, particularly during flood conditions (McClintock, 1985)."
706	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Propagules bird dispersed? Yes] "Wild or feral animals and birds are important agents of short-distance dispersal in pasture and upland areas, both by carrying seeds and creating disturbance that assists germination and recruitment. Some secondary local dispersal may be due to ants (McClintock, 1985)."
707	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Propagules dispersed by other animals (externally)? Yes. Ants] "Seed dispersal: French broom pods burst open explosively, ejecting seeds up to 13 feet (4 m). Seeds are further dispersed by ants, birds, and other animals and in river water, rain wash, and mud, and by vehicles and machinery [1,11]."
708	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Propagules survive passage through the gut? Unknown] "Wild or feral animals and birds are important agents of short-distance dispersal in pasture and upland areas, both by carrying seeds and creating disturbance that assists germination and recruitment. Some secondary local dispersal may be due to ants (McClintock, 1985)."
801	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Prolific seed production (>1000/m2)? Yes] "Seeds are copiously produced and long-lived, and the soil seed bank may contain more than 6,000 seeds per square meter."
801	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Prolific seed production (>1000/m2)? Yes] "A review by Bossard [11] reports French broom seed bank densities range from 465 to 6,733 seeds/m². An average of 10,000 dormant broom seeds/m² occurred in the litter and soil under mature French broom stands in Marin County (Parker and Kersnar 1989, cited by [49]). Average French broom seed bank densities of 3,774 seeds/m² and 2,563 seeds/m² were recorded at 2 sites in Australia [1]. Seed bank densities seem to increase with soil depth with the age of the broom stand [49]."
801	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Prolific seed production (>1000/m2)? Yes] "Seed production increases asymptotically with plant age for all populations, peaking at ca. 100,000 seeds per plant for 5- to 6-year-old individuals growing without competition (Lloyd, 2000). In the exotic range in California, USA, seedbanks, up to 9000 seeds/m² have been recorded (Parker and Kersner, 1989; Alexander and D'Antonio, 2003) and seed banks were found not to increase significantly with stand age suggesting annual seedbank losses quickly equalled annual seed rain (Alexander and D'Antonio, 2003). In Australia, annual seed rain can range from 2500 to 13,500 seeds/m², setting up seedbanks of between 30,000 and 100,000 m² with an annual seedbank decay rate of 23-50% largely resulting from failed germination."
802	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? Yes] "Seeds are copiously produced and long-lived, and the soil seed bank may contain more than 6,000 seeds per square meter."
802	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Evidence that a persistent propagule bank is formed (>1 yr)? Yes] "Dormancy of French broom seed is enforced by a hard coat that prevents imbibition. A large proportion (60%-82%) of French broom seed is dormant upon dispersal ([1,49], and references therein). The high rate of seed production coupled with high rates of seed dormancy result in a rapid build-up of persistent, soil-stored seed [1]. French broom seeds are known to survive at least 5 years in soil (Bossard, unpublished data cited in [11]). A large number of dormant French broom seeds in the soil seed bank can lead to high germination rates following soil and vegetation disturbance such as that caused by fire [1]. Even though seed densities tend to decrease with distance away from broom stands, there may be sufficient numbers to support a population expansion after fire ([49] and references therein)."

802	2013. Geerts, S./Botha, P.W./Visser, V./Richardson, D.M./Wilson, J. R.. Montpellier broom (Genista monspessulana) and Spanish broom (Spartium junceum) in South Africa: An assessment of invasiveness and options for management. South African Journal of Bota	[Evidence that a persistent propagule bank is formed (>1 yr)? Yes] "Once established, G. monspessulana and S. junceum accumulate large, persistent soil stored seed banks, ranging in size between 909 and 22,727 (median 1970) seeds/m2 and 0 and 21,364 (median 455) seeds/m2 for the two species respectively."
803	2001. Parsons, W.T./Cuthbertson, E.G.. Noxious Weeds of Australia. Second Edition. CSIRO Publishing, Collingwood, Australia	[Well controlled by herbicides? Yes] "When chemical control is required, picloram, either alone or in a commercial mixture with triclopyr, is effective if plants are in full leaf. Follow-up spraying is necessary to treat seedlings and regrowth which will occur particularly with larger plants. Glyphosate is recommended in some areas."
803	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Well controlled by herbicides? Yes] "Chemical control is done by foliar spraying of glyphosate, 2,4-D, or picloram plus triclopyr applied to plants in full leaf"
803	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Well controlled by herbicides? Yes] "Chemical: Herbicides are effective in gaining initial control of a new invasion (of small size) or a severe infestation, but are rarely a complete or long-term solution to invasive species management because they do not change conditions that allow infestations to occur [15]. Herbicides are more effective on large infestations when incorporated into long-term management plans that include replacement of weeds with desirable species, careful land use management, and prevention of new infestations. See the Weed control methods handbook [76] for considerations on the use of herbicides in natural areas and detailed information on specific chemicals and adjuvants. Also see the broom Element Stewardship Abstract [37] and other reviews [11] for more detailed information on chemical control. Glyphosate is effective in some situations, but is likely to impact nontarget species, and broom sprouting occurs. Triclopyr ester is effective in killing French broom with a low volume, basal bark application to the main stem. This application does not impact nontarget species but is time consuming. Used alone and in combination with other herbicides, 2,4-D has been used to control French broom ([11] and references therein)."
804	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "The shrub easily resprouts from the root crown after damage"
804	2005. Zouhar, K.. Genista monspessulana. In: Fire Effects Information System, [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, http://www.fs.fed.us/database/feis/ [Accessed 15 Oct 2013]	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "French broom may also sprout from the root crown [11] or upper stem [12] when aboveground parts are removed by cutting, freezing, or fire. " … "French broom can sprout from the root crown after cutting. Once seedlings are taller than approximately 8 inches (20 cm), their rate of sprouting after cutting can be over 90%, particularly if cut in the rainy season (Bossard, unpublished data in [11]). Boyd [12] also reports sprouting from the stem following top-kill by fire."
805	2013. CABI. Genista monspessulana In: Invasive Species Compendium. CAB International, Wallingford, UK www.cabi.org/isc	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown] "The arthropod natural enemies of G. monspessulana have been the subject of recent studies (Sheppard, 2000, 2003; Sheppard and Thomann, 2004). At least 90 arthropod species are associated with Montpellier broom in Europe, and several other generalist species are now found on broom in its exotic range (Sheppard, 2003; Sheppard and Thomann, 2004). Of these, 52 species are considered specific at least to the level of the tribe. Currently only four species seem likely to be specific to G. monspessulana; the psyllid Arytinnis hakani, the apionids (Lepidapion sp. nov. and Oryxolaemus sp. nov.) and the nepticuliid (Trifurcula serotinella). The eriophyid mite Aceria genistae has also been recorded from G. monspessulana in the USA (Chan and Turner, 1998). Natural enemies that have caused noticeable damage in the native range sufficient to affect Montpellier broom growth and spread are listed in the table. In the native range, this broom is regularly defoliated by the moth Uresiphita polygonalis and a combination of stem boring insects regularly kills immature plants in eastern France. The pathogen Uromyces genistae attacks the older leaves in spring/summer in Europe and the USA (Guynot and Massenot, 1958; Sheppard, 2000)."

Summary of Risk Traits

High Risk / Undesirable Traits

- Environmentally versatile
- Widely naturalized
- A weed of forestry plantations
- An environmental weed
- Related *Genista* species have become invasive
- Reputedly toxic to cattle
- May increases fire hazard with flammable biomass
- Shade tolerant
- Tolerates many soil types
- Can from dense monocultures that exclude other vegetation
- Limited self-compatibility
- Accidentally & intentionally dispersed by seeds
- Prolific seed production
- Forms a persistent seed bank
- Resprouts after damage from cutting or fire

Low Risk Traits

- May be limited to higher, cooler elevations in tropical island ecosystems
- Unarmed (no spines, thorns or burrs)
- Palatable to goats
- Does not spread vegetatively
- Valued as an ornamental in some locations
- Herbicides provide effective control under certain circumstances