

**WRITTEN FINDINGS OF THE  
WASHINGTON STATE NOXIOUS WEED CONTROL BOARD  
DRAFT August 24, 2012**

Scientific name: *Genista monspessulana* (L.) L. A. S. Johnson

Synonyms: *Cytisus monspessulanus* L., *Cytisus monspessulanus* var. *umbellulatus* (Webb) Briq., *Teline candicans* var. *umbellulatus* Webb & Berthel., *Teline monspessulana* (L.) K. Koch

Common name: French broom, canary broom, cape broom, Montpellier broom, soft broom

Family: Fabaceae

Legal Status: Proposed Class A noxious weed

**Description and Variation:**

(Unless otherwise noted, information in this section is from DiTomaso and Healy (2007).

**Overall Habit:**

*Genista monspessulana* is a shrub in the Fabaceae (legume) family that typically grows less than 3 m (10 feet) tall but sometimes grows to 5 m (16 feet) tall (Baldwin et al. 2012, Bossard 2000). Plants can be evergreen or deciduous; in California *G. monspessulana* keeps much of its leaves in coastal areas and loses more of its leaves in inland areas (Bossard 2000). Stems are erect, typically leafy and covered in silky, silvery hairs (Baldwin et al. 2012, Stace 2010). Younger stems are green and round in cross-section and often strongly 8-10 ridged, while older stems are brown and may not have ridges.

**Roots:**

*Genista monspessulana* is a taprooted shrub that has fine roots associated with nitrogen-fixing bacteria.

**Leaves:**

Leaves are alternately arranged with a petiole (<5mm) and compound with 3 leaflets (Baldwin et al. 2012). Leaflets are oblong to obovate and variable in size with most 10-20 mm long, with the length generally +/- 2 times the width (Baldwin et al. 2012). The leaf's upper and lower surface is sparsely to densely covered with appressed short, silvery hairs. Leaf stipules are somewhat awl-shaped, to 3mm long, hairy and deciduous.



Figure 1. Left: *G. monspessulana* plants in California. Right: *G. monspessulana* compound leaves with 3 leaflets. Both images: John M. Randall, The Nature Conservancy, Bugwood.org

### Flowers:

Its lightly scented flowers are in head-like racemes of 4-10 at the ends of short, axillary branchlets (Baldwin et al. 2012). Flowers have pedicels 1-3 mm long. The calyx is 5-7 mm with silky hairs and +/- 2-lipped, with the top lip 2-lobed nearly to the middle and the lower lip with (1-) 3 shallow lobes (Baldwin et al. 2012). Flowers are pea-like (papilionaceous), bright yellow to light yellow and 9-12 mm (Stace 2010, Baldwin et al. 2012). The flower's style is abruptly bent or curved near its tip (DiTomaso and Healy 2007). Flowers are insect pollinated and have fused keel petals that an insect visitor must split in order to release the style and anthers (Parker and Haubensak 2002). In California, Parker and Haubensak (2002) observed 3 species of bees pollinating *G. monspessulana*--*Apis mellifera*, *Bombus vosnesenskii* and *Xylocopa californica*, though the *X. californica* was observed only once.



Figure 2. Left and Right: Examples of *Genista monspessulana* in bloom May 5, 2011 at the Montlake Cut in Seattle, Washington on the University of Washington campus.

In California, flowers generally bloom March through May (DiTomaso and Healy 2007). Bossard (2000) notes that *Genista monspessulana* flowers during late March-May inland and March-July on the coast. DiTomaso and Healy (2007) have observed that some plants in large populations flower for most of the year in milder climates. In Oregon, *G. monspessulana* is noted to flower from April to June (Oregon Department of Agriculture n.d.).

### Fruits and Seeds:

The seed pods (legumes) are brown at maturity and slightly flattened, 1-3 cm long, and densely covered with appressed, long, silky, silvery to reddish gold hairs. Pods have been noted to have 3-6 seeds per pod (Baldwin et al. 2012, Stace 2010) and 5-8 seeds per pod on average. Seeds are black, 2-3 mm long and ovoid, shiny and smooth.

### Look-alikes:

There are two other similar yellow-flowering brooms on Washington State's noxious weed list: *Cytisus scoparius* (Scotch broom), a Class B noxious weed and *Spartium junceum* (Spanish broom), a Class A noxious weed. Compared to *Genista monspessulana*, *S. junceum* can be distinguished by its simple leaves that are often very sparse on round, finely ridged, green hairless stems and flowers in open clusters (racemes) at stem tips. *C. scoparius*, in comparison to *G. monspessulana*, has leaves with compound leaves of 3 leaflets and simple leaves, fewer leaves overall, stems that are typically 5-angled and flowers that are single or paired in leaf axils and about twice as big as *G. monspessulana*. A supplemental handout is available that details key differences of the three plants and includes pictures.

### Habitat:

*Genista monspessulana* grows in open, disturbed sites including logged or burned areas, roadsides and pastures (DiTomaso and Healy 2007). It can also be found in less disturbed to undisturbed sites such as grasslands, coastal scrub, oak woodlands, riparian areas and open forests (DiTomaso and Healy 2007). It can tolerate small amounts of shading along the edges of forest canopies but does not grow in heavy shade (DiTomaso and Healy 2007). *G. monspessulana* can grow in a variety of soil moisture conditions and prefers siliceous soils (Bossard 2000). Plants are found at lower elevations, being noted at less than 900 m (Baldwin et al. 2012) or up to only 500 m (DiTomaso and Healy 2007). Plants are noted to tolerate frost but may die back after severe winters, though roots and lower stems may survive and resprout (DiTomaso and Healy 2007). *G. monspessulana* seedlings are noted to be less frost tolerant than *Cytisus scoparius* (Scotch broom) (Bossard 2000). As *G. monspessulana* was originally introduced via the nursery trade, plants may still be found growing in ornamental landscapes.

#### Geographic Distribution:

*Genista monspessulana* is native to countries surrounding the Mediterranean and in the Azores (Bossard 2000) and is noted to have naturalized in a number of countries throughout the world including parts of Africa, Australia, New Zealand, the United Kingdom, the western United States and southern South America (USDA ARS 2012).

#### Native Distribution:

*Genista monspessulana* is native to Northern Africa (Algeria, Morocco, Tunisia), Western Asia (Lebanon, Turkey), Caucasus (Georgia), Southeastern Europe (Albania, former Yugoslavia, Greece, Italy) and Southwestern Europe (France, Portugal, Spain) (USDA ARS 2012).

#### Distribution in North America:

*Genista monspessulana* grows along the west coast in California, Oregon and Washington (USDA NRCS 2012). Herbarium specimens also document *G. monspessulana* growing in southern British Columbia, Canada (University of British Columbia Herbarium). It is a C List noxious weed in California, a listed noxious weed in Hawaii, and a Class B noxious weed and quarantined plant in Oregon (USDA NRCS 2012).

*Genista monspessulana* was originally introduced to California as an ornamental plant in 1871 and was noted naturalizing in central California in 1944 and in Marin County in 1949 (McClintock 1985). Hitchcock et al. (1961) noted it occasionally escaped from gardens west of the Cascade Mountains from British Columbia to northwest California. As of 2000, it was estimated that *Genista monspessulana* occupied approximately 100,000 acres in California (D. Barbe, pers. comm. in Bossard et al. 2000). Of the *G. monspessulana* plants identified in California, many may actually be hybrids involving two very similar species, *Genista canariensis* (Canary Island broom) and *Genista stenopetala* (leafy broom) (DiTomaso and Healy 2007). In Oregon, *G. monspessulana* was first documented in Curry County in 1924 (Oregon Department of Agriculture, n.d.) and now is noted to be widespread in southwest to western Oregon and have limited distribution in western to northwestern Oregon (Figure 3).



Figure 3: Oregon Department of Agriculture 2011 *Genista monspessulana* distribution map.

### History and Distribution in Washington:

Historically planted as an ornamental plant, *Genista monspessulana* may be growing in gardens and managed landscapes in Washington. Currently, *Genista monspessulana* does not appear to be sold in the nursery trade in Washington (Bob Buzzo, pers. comm.).

*Genista monspessulana* was identified in early 2010 naturalized on the southeast slope by the water of the Montlake Cut on Seattle's University of Washington campus. It is a population of over 100 mature shrubs and thousands of seedlings that have reportedly existed there for several years. The population makes up an area of 200,000 square feet. It is unknown how *G. monspessulana* was introduced to the area. As far as it is known, this is the only escaped population of *G. monspessulana* in Washington. Surveys of county noxious weed board coordinators in 2012 did not identify any additional naturalized populations of *G. monspessulana*, and a review of online herbaria records came up with one specimen that was collected in Clallam County Washington (Faubion 132, 1979). The online scan of this specimen does not support its identification as *Genista monspessulana* as its flowers are solitary in arrangement on the plant, not in head-like racemes of 4-10 flowers.



Figure 4. Left: *Genista monspessulana* in bloom and growing on the Montlake Cut of Seattle's University of Washington Campus in 2011. Right: *G. monspessulana* seedlings growing at the same location in 2011.

### Biology:

#### Growth and Development:

*Genista monspessulana* typically lives 10 to 15 years (Waloff, pers. comm. in Bossard 2000). Seeds are noted to germinate in California from December to July (Bossard unpubl. data in Bossard 2000). In Australia, seeds germinate in spring and fall (DiTomaso and Healy 2007). Plants produce their most vegetative growth from April to July (Bossard 2000). Plants are reproductive at 2 to 3 years of age when they reach a height of 45-60 cm (1.5 to 2 feet) (Bossard 2000). Plants often form dense stands.

#### Reproduction:

*Genista monspessulana* spreads by seeds and plants often produce copious seed pods (DiTomaso and Healy 2007). Plants can produce over 8,000 seeds a year (Bossard, unpubl. data in Bossard 2000) and seedbanks have been found to contain 465 to 6,733 seeds per square meter (Hoskings 1994, Parker and Kershner 1989 in Bossard 2000). Seed pods open explosively, sending seeds up to 4 m (Bossard 2000). Seeds can be further dispersed by ants, birds, animals, in river water, rain wash, mud, road grading or maintenance machinery (McClintock, pers. observation in Bossard 2000, Parsons 1992 in Bossard 2000, DiTomaso and Healy 2007). Once dispersed, seeds can then survive at least 5 years in the soil (Bossard unpublished data in Bossard 2000).

*Genista monspessulana*'s roots do not produce new shoots, but plants can resprout when cut, frozen or burned above the crown, especially during the rainy season (DiTomaso and Healy 2007, Bossard et al. 1995 in Bossard 2000).

### **Control:**

Preventing new populations of *Genista monspessulana* from establishing and spreading is the best way to minimize costs and impacts of this invasive shrub. It is critical to minimize soil disturbance, monitor areas being controlled and pull young plants before they produce seeds to help prevent new infestations (DiTomaso and Healy 2007). Since seeds can survive in the soil for at least 5 years, areas will need to be monitored over 5 years to prevent seedling establishment.

To control *Genista monspessulana* infestations, it is best to use an integrated weed management (IWM) approach. By combining these different control methods, infestations can be prevented and controlled.

### **Response to Mechanical Methods:**

*Genista monspessulana*, as with other weedy broom species, can be effectively pulled with weed wrenches. Weed wrenches are effective for removal of small infestations or where an inexpensive, long-duration labor source is dedicated to broom removal (Bossard 2000). Since using weed wrenches disturbs the soil, it is important to watch the area for seedlings (Bossard 2000). Bossard (2000) also notes that using a brush hog on *G. monspessulana* can be less labor intensive but can damage desirable plants and cannot be used on steep slopes.

Bossard (2000) also notes a carefully timed cutting and mowing regimen from Archbald (1996) that has had reported success. Plants are first cut to or below ground level in late July or August after going to seed, when there is a low amount of moisture in the soil. Then dispose of cut plant parts (dry parts can be burned in the spring), being careful not to spread any seeds or seed pods. Next, destroy *G. monspessulana* seedlings the following summer by mowing as close as possible to the ground after grasses have dispersed their seed. Lastly, repeat this cycle for the next 5 or 6 years or until the seedbank is exhausted (Bossard 2000).

Prescribed burns may help reduce the *Genista monspessulana* seedbank (Alexander and D'Antonio 2003) and be one method used in an IWM plan to control *G. monspessulana*. After a burn, the initial flush of germinating seedlings can remove a large amount of seed from the seedbank (Alexander and D'Antonio 2003). It is then important to remove this flush of seedlings as well as the seed germinants for years to come, to prevent the re-infestation of the area. The success of a prescribed burn will depend on a number of factors including temperature of the fire and site conditions. Also, prescribed burns do not prevent *G. monspessulana* root crowns resprouting (DiTomaso and Healy 2007).

Flaming is another method used in an IWM approach to manage *Genista monspessulana* (Moore (2004). Flaming--using a torch that is hot but does not have a flame--to quickly pass over the plants, can be an effective method to control *G. monspessulana* seedlings (Moore 2004). This method has been used in California on annuals or seedlings of perennials in wet conditions, after the first rains of fall or winter, when the ground is too wet to carry fire (Moore 2004). For *G. monspessulana*, Moore (2004) used flaming for several years with success to control large flushes of seedlings which arise after the initial stand of parent plants was removed. It is best to flame these seedlings when they are in the cotyledon stage (seeds have only their first set of leaves) and up until the plants have about 3-5 true leaves or about are 20 cm tall (Bossard 2000, Moore 2004). The heat does not cause the plants to burn but they will wilt and die within a day (Bossard 2000). Timing of treatment is important, and instructions and safety procedures should be closely followed when using this method.

Applying a layer of wood chip mulch can also decrease the germination of *Genista monspessulana* seedlings. This may be a technique to use to control seedlings after adult plants have been removed (Bossard 2000).

#### Response to Cultural Methods:

Since *Genista monspessulana* plants do not grow in dense shade, plant native and desirable plants in areas of *G. monspessulana* infestations to create canopy cover that will limit its growth and spread.

#### Biological Control:

A seed beetle, *Bruchidius villosus*, which is used on *Cytisus scoparius*, was found to attack *Genista monspessulana* in the Eugene area in Oregon (Oregon Department of Agriculture n.d.). This beetle was an accidental introduction to the East Coast, but went through TAG (Technical Advisory Group on the Introduction of Biological Control Agents of Weeds) testing protocol for safety in order to be introduced into Oregon (Oregon Department of Agriculture n.d.). This seed beetle's larvae feed on the seeds of *G. monspessulana* and the adults feed on the pollen (Oregon Department of Agriculture n.d.).

Using goats for grazing is another possible management option for *G. monspessulana*. Bossard (2000) reports grazing by goats for 4 or 5 years during the growing season has been shown to be effective in New Zealand. Goats that are confined to a small area can help control young shrubs and crown resprouts that result from initial control methods (DiTomaso and Healy 2007). Goats are non-selective grazers so native and desirable plants will need to be protected.

#### Response to Herbicide:

Herbicide treatments can be used to control *Genista monspessulana* but herbicidal control of large infestations may be expensive as plants often need repeat treatments for several years (DiTomaso and Healy 2007).

Bossard (2000) recommends a few herbicide applications for use on *Genista monspessulana*, including a foliar spray using 3% glyphosate to treat mature plants along with a surfactant to improve efficacy (Parsons 1992 in Bossard 2000). A basal bark application using triclopyr ester (25%), in Hasten or Penevator oil (75%) in one spot, low volume application with a wick (Bossard et al. 1995). Bossard (2000) notes that it was necessary to spot only the main stem with 2 or 3 drops of herbicide, within 8 cm of the ground surface, to obtain a 99% kill of 8-year-old *G. monspessulana* in an experiment conducted in Mendocino County. Both treatments should be used during periods of active growth after flower formation and seed set but before seeds dehisce (Bossard 2000).

Bossard (2000) also notes that 2,4-D alone or with additives such as diquat, picloram, dicamba, and sodium chlorate, have been used to control *Genista monspessulana*. Chemical control can result in standing dead biomass, which can make monitoring and treatment of seedlings difficult (Bossard 2000) unless it is removed.

Please refer to the PNW Weed Management Handbook, available online at <http://weeds.ippc.orst.edu/pnw/weeds> for specific herbicide instructions, as herbicide recommendations may have changed since the time of this writing.

#### Economic Importance:

##### Detrimental:

*Genista monspessulana* is an aggressive pioneer species that can displace native plants and forage species, and wildlife (Bossard 2000, DiTomaso and Healy 2007). It is also noted as making reforestation difficult (Bossard 2000, DiTomaso and Healy 2007). *G. monspessulana* is a strong competitor and can dominate a plant community, forming monospecific stands (Bossard 2000). It may also alter the soil nitrogen dynamics

of invaded area (Haubensak et al. 2004). *G. monspessulana* is believed to be responsible for reducing arthropod populations by one third in Golden Gate National Recreation Area (Lanford and Nelson 1992 in Bossard 2000). Also, Bossard (2000) notes that *G. monspessulana* readily burns and carries fire to the tree canopy layer and increases both the frequency and intensity of fires. Its longer-lived seedbank makes it difficult to eradicate once established (Bossard 2000). Annual costs for right-of-way maintenance on roadways, power lines and private property can reach millions of dollars a year because the species is so persistent (Oregon Department of Agriculture n.d.). Roadside infestations can also obstruct views of drivers, creating safety problems (Bossard 2000).

The foliage and seeds of *G. monspessulana* are unpalatable to most livestock and anecdotal evidence indicates it may be slightly toxic except to goats (Oregon Department of Agriculture n.d., Montllor et al. 1990 in Bossard 2000). Broom species flowers and seeds do contain quinolizidine alkaloids that can be toxic to humans and livestock when ingested, but toxicity problems due to brooms are uncommon (DiTomaso and Healy 2007).

Beneficial:

*Genista monspessulana* was originally introduced as an ornamental plant.

**Rationale for Listing:**

*Genista monspessulana* is an invasive perennial shrub that is a noxious weed on the west coast of the United States in California and Oregon. In areas it has established along the west coast, *G. monspessulana* forms dense growth that outcompetes native and forage plants. *G. monspessulana* has also interfered with reforestation efforts and aided the spread of wildfires into tree canopy layers. With high seed production and seeds that can live at least 5 years in the seedbank, established infestations are difficult to eradicate. *G. monspessulana* is listed as a noxious weed in California where, in 2000, 1000,000 acres of it were estimated to be growing and control efforts have been ongoing since the 1980s. There is currently only one known naturalized population of *G. monspessulana* in Washington State making it a candidate for a Class A noxious weed listing. This Class A listing will prioritize the early detection and eradication of new populations of *G. monspessulana*, before they become established.

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