***Cytisus scoparius* (L.) Link** Scotch broom
FABACEAE

Synonyms: *Sarothamnus scoparius* (L.) Wimmer ex Koch
Genista scoparius Lam.
Spartium scoparium L.

Drawing source: Britton and Brown 1913.

General Description.—Scotch broom is also known as broom, common broom, Scot's broom, English broom, green broom, broom tops, Irish tops, witch's broom, basam, escoba negra, and retama de escobas. It is a shrub, usually 1 to 2, occasionally 3 m in height, which sheds its leaves early and remains leafless for most of the year. The green twigs are the principal photosynthetic organs. Branches are upright to arching. The angular, flexible twigs often occur in moderately long sprays. Old stems become gray-brown. The plant grows a deep root system with a taproot. Leaves are trifoliate low on the twigs and simple and sessile near the tips. The obovate to lanceolate leaflets are 4 to 8 mm long, and petioles are 2 to 10 mm long. It's perfect flowers, which are solitary in leaf axils or in clusters of two or three, are about 2 cm long, brilliant yellow, and have the typical form of flowers in the pea family. Orange, red, pink, purple, and lilac flowers are available in ornamental varieties. The fruits are dark brown, linear pods 4 to 5 cm long that are ciliate at the margins and contain five or six seeds each. The seeds are 3 to 4 mm long, greenish brown, and in the form of a flattened oval. There are 2n = 46 or 48 chromosomes (Abrams 1944, Meyer 2003, New England Wild Flower Society 2003 University of Connecticut 2003, Welsh and others 1987).

Range.—Scotch broom is native to Western and Eastern Europe, including the Mediterranean islands, the British Isles, and western Scandinavia. It has been planted and naturalized in Eastern and Western United States, Hawaii, Canada, the Azores, the Canary Islands, Australia, New Zealand, South Africa, India, China, and parts of southern South America (International Legume Database and Information Service 2003, Natural Resources Conservation Service 2003). Two varieties of Scotch broom have naturalized in the United States. Variety *andreanus* occurs only in California and var. *scoparius* accounts for the rest of the naturalized range (Natural Resources Conservation Service 2003).

Ecology.—Scotch broom grows as scattered plants, small clumps, and pure stands, and competes fiercely with forbs, grasses, and tree seedlings. It requires disturbance, especially disturbance resulting in bare mineral soil to become established. It prefers sandy soils, but will grow in a wide variety of well-drained soils (Prasad 2003). Scotch broom is drought tolerant. The species is intolerant of shade and cannot survive under a closed forest stand. Nitrogen fixation occurs in root nodules, and fixed nitrogen is released to the environment in the litter (Parker and others 1994). Top injury from subfreezing temperatures may occur in cold climates, but plants usually survive (Michigan State University Extension 1998). Scotch broom is commonly seen

along roads, in vacant lots and inactive construction sites, in old logging areas, in neglected pastures and orchards, and along fence-rows.

Reproduction.—Scotch broom flowers in May or June (New England Wild Flower Society 2003). The flowers are pollinated by honey bees and bumblebees (Meyer 2003). Seed production starts when plants are 2 years old in Tasmania with around 300 seeds/year and increases to 12,000 to 30,000 seeds/shrub/year. The seeds are spread by explosive release from the pods, which can throw the seeds 1 to 3 m (Alchemy-works 2003), as well as by water, soil movement, and machinery (National Haritage Trust 2003). Ants also disperse seeds. Seeds average 125 seeds/g. (Meyer 2003). Seeds can remain viable in the soil seed bank for as long as 80 years (National Haritage Trust 2003). The species can also be propagated with cuttings (University of Connecticut 2003).

Growth and Management.—Scotch broom grows from 30 to 46 cm/year (Michigan State University Extension 1998) and usually lives from 10 to 15 years (Prasad 2003). Fruits can be picked by hand after they are mature but before they burst open. They should be spread to dry, threshed, and screened. These seeds are orthodox and can be stored for many years. Because they are hard-coated, scarification is needed to ensure adequate and uniform germination. This can be done by nicking or sanding the seed coat or by applying dry heat for 1 minute at 130 °C or 15 minutes at 70 °C. Viability is normally about 80 percent. Because roots are delicate, the use of containerized stock is recommended for planting rather than bare-root stock (Meyer 2003). However, because the species is invasive, planting for conservation or ornamental purposes is usually discouraged. In fact, the species has been declared a noxious weed in five Western States where planting is prohibited (Natural Resources Conservation Service 2003). Scotch broom is not a problem in cultivated land or in land fully timbered, only in pastures, roadsides, sites normally occupied by low vegetation, and in regenerating timberlands. Control of Scotch broom is difficult. Grubbing large plants and pulling seedlings, or power cultivation, effectively kills the plants, but new seedlings continually appear from the soil seed bank. Mowing only encourages branching near the ground. Stands of Scotch broom do not carry a fire readily (Parker and others 1994), and burned stands reproduce prolifically. The application of herbicides has sometimes been effective (Prasad 2003). A number of insect enemies of Scotch broom have arrived accidentally or have been introduced into the United States. They may already be having a minor impact on the competitive ability of the species (Syrett and others 1999). Research into biological control continues, particularly in Australia and New Zealand (CSIRO 2003).

Benefits.—Scotch broom, which produces a spectacular annual floral display and possesses a unique form, has been planted throughout the temperate regions of the world as border and accent plants. It is particularly useful in this regard because it succeeds on poor soils with little care. It has also been used successfully to protect exposed soils and stabilize dunes. Scotch broom furnishes food (mainly from the seeds) and cover for wildlife. The leaves and twigs are generally unpalatable to domestic livestock and wild mammals. The tissues contain the alkaloids cytisin, sparteine, and isosparteine, and the glycoside scoparin. However, large amounts must be ingested before illness or death results (Everest and others 2003). The stems and twigs have been used from ancient times to make brooms and were used for ritual brooms called besoms. The species was also used to make baskets, thatching, wattle fencing, and a green dye, and to flavor beer before the introduction of hops (Alchemy-works 2003). Decoctions of the twigs and leaves were and are still occasionally used to treat gout, jaundice, edema, and other conditions (Grieve 2003).

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