Chamaecytisus palmensis

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Fabaceae - Papilionoideae

LOCAL NAMES
English (tree lucerne); Spanish (tagasaste)

BOTANIC DESCRIPTION
Chamaecytisus palmensis is an attractive, evergreen shrub or small tree with long, drooping branches, when managed as a single-stemmed tree it reaches heights of 7-8 m, but its common growth form is a multi-stemmed, spreading shrub of 5-7 m.

Leaves are on short petioles, leaflets lanceolate, glabrous above, pubescent below.

Flowers white, in umbels mostly at the end of short branchlets, fragrant, pea-like, produced in profuse masses; calyx tubular, pubescent, 10-12mm long; standard about twice as long.

Fruit a pod, 4-5 cm long, 12 mm broad, pubescent, black when ripe.

Seeds black, 8-12 per pod.

BIOLOGY
In southern Australia, flowers appear in early spring (July-September) and pods ripen in November-December.

foliage (Western weeds)

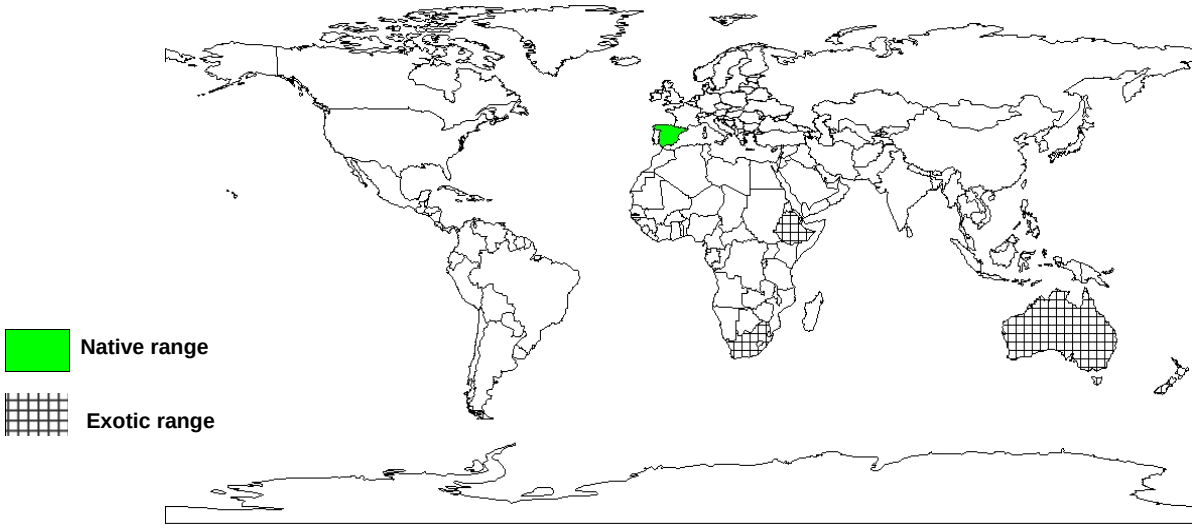
Cattle grazing Chamaecytisus palmensis in southwestern Western Australian (Shelton H.M.)

ECOLOGY
In its original environment, tagasaste was restricted to the slopes of the volcanic mountain which dominates the small island of La Palma, where the climate is extremely arid. C. palmensis is adapted to temperate regions with winter rains, prolonged dry summers and annual rainfall ranging from 350-1 600 mm. The shrubs tolerate a wide range of temperatures. In New South Wales, it tolerates annual frosts down to –15 deg C. It is found from sea level to elevations of 1 000 m and reportedly survives at 3 000 m in Ethiopia.

BIOPHYSICAL LIMITS
Altitude: 0-1 000 m
Mean annual rainfall: 350-1 600 mm
Soil type: C. palmensis establishes most easily on sandy soils, but tolerates a wide range of soil types including gravels, loams, acid laterites and limestones. The shrub tolerates a pH range of 5-7 but requires free draining soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Spain
Exotic: Australia, Ethiopia, New Zealand, Rwanda, South Africa



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Fodder: The foliage contains 17-22% crude protein. The leaves and fine stems of fresh regrowth may contain 25-29% crude protein (dry matter) and only 16-19% crude fiber. The foliage is free from toxic substances. Leaves have high in-vitro dry-matter digestibility (0.77-0.82).

Apiculture: The fragrant flowers are a source of bee forage.

Fuel: When allowed to grow, thick branches provide fuelwood that burns with intense heat.

SERVICES
Erosion control: The tree lucerne helps control soil erosion.

Shade or shelter: The shrubs provide shelter for livestock and crops, and act as fire breaks.

Reclamation: Tagasaste helps control salinization and reclaim wastelands.

Nitrogen fixing: It increases soil fertility through nitrogen fixation.

Ornamental: The shrubs have no thorns and produce profuse masses of fragrant white pea-like flowers, making them attractive ornamental plants.

Boundary or barrier or support: Tagasaste forms dense hedges if planted closely.

Intercropping: Interplanted crops grow well because the shrubs provide protection from cold and drying winds.

TREE MANAGEMENT
Seedlings are remarkably drought resistant and can survive 6 months of hot weather without rain or irrigation. Animal-proof fences are essential for the first 2-3 years to protect young seedlings from browsing. In regions with annual winter rains of 600-1 000 mm, established shrubs planted in rows 5 m apart could produce 15-20 kg of edible dry matter/plant when harvested once a year. In-row spacing can vary from 25 cm to 2 m. At a planting density of 1 000 trees/ha, annual yields of 15-20 t/ha can be expected. Under current systems of dryland farming in Western Australia, plantations produce 10 t/ha of edible dry matter from a single annual grazing or cutting. When 10 months old the shrubs should be cut or grazed to encourage formation of bushes with multiple stems. Even when grazing is severe, vigorous leaders remain. It is essential to lop these annually. In Western Australia, super-phosphate and potash (3:2) should be applied annually at a rate of 200 kg/ha. Application of micronutrients, such as calcium may also be necessary.

GERMPLASM MANAGEMENT
There are 35 000-40 000 seeds/kg. Seed storage behavior is orthodox. Long-term storage under IPGRI but preferred conditions at RBG Kew, have been undertaken. Viability is maintained for 11 years. The small black seeds are extremely hard and must be scarified or treated with boiling water for 1 minute to ensure quick germination. Seeds germinate within 7-14 days.

PESTS AND DISEASES
Slugs, cutworms and grasshoppers eat emerging seedlings, but application of insecticide at seeding appears to give adequate protection. Rabbits and hares eat seedlings. Lepidosaphes ulmi, Aphis cytisorum, A. craccivora, Frankliniella occidentalis, Phyllonorycter cytisifoliae and P. cytisella cause heavy damage.

FURTHER READNG

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SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)