

FACTSHEET

Tagasaste

June 2022

Tagasaste (also known as Tree Lucerne) is a fast-growing evergreen tree, which is drought tolerant and fixes nitrogen in the soil. Its leaves are highly palatable to sheep and cattle, making it an ideal supplementary feed option during drought or winter months. Tagasaste's other benefits include providing shade and shelter for livestock, a food source for pollinating insects and erosion control.

Tagasaste (*Cytisus proliferus var. palmensis*) grows 5-6 m high and wide, with a potential lifespan of up to 15 years.

Benefits of growing Tagasaste

Tagasaste can be a valuable forage for livestock by providing edible dry matter (leaf and soft stem) and minerals. The leaves are highly palatable, with high crude protein content and moderate to high dry matter digestibility (>70%), which is similar to high quality lucerne hay. Tagasaste's metabolisable energy is comparable to perennial ryegrass during summer and autumn, but lower than typical values for white and red clover.

Tagasaste generally produces less than 10 t/ha/yr of edible dry matter, depending on the planting density and site. It is ideal as a supplementary feed during times of feed shortage, such as a drought or through winter, as it is evergreen.

Other benefits include:

- Shade and shelter for livestock
- Food source for pollinating insects
- Erosion control
- Nurse crop for native plantings
- Carbon sequestration (although it is not currently included in the New Zealand Emissions Trading Scheme)
- Sustaining native birds when it is flowering during winter, and
- Amenity planting.



Tagasaste has drooping branches with grey-green leaves and a profusion of cream pea-shaped flowers from late winter to mid-spring.



Tagasaste is good for erosion control and can double as a source of supplementary feed when needed.

Improved livestock performance

Tagasaste is best used as a supplementary feed on hill country when there is insufficient pasture.

Despite Tagasaste's moderate to high crude protein content and digestibility, livestock growth rates from a sole diet of tagasaste are low compared to grazing improved pasture.

A 1990 trial showed lambs in Canterbury (approx. 23 kg liveweight) fed tagasaste as a sole diet for six weeks gained 81 g/day, compared with those fed lucerne, which grew 265 g/day.

In a 1997 Australian trial, young cattle (approx. 190 kg) gained 1.0-1.5 kg/head/day in cool moist winter-spring conditions. But, in hot and dry summer-autumn conditions, growth rates dropped to <0.5 kg/head/day.

Tagasaste contains phenolic compounds, such as condensed tannins. High levels of condensed tannins may reduce palatability and feed intake during summer. In New Zealand, tagasaste in hill country is best used as a browse species to supplement a pasture-based diet. In this way, pasture can reduce the potential negative effects of condensed tannins on intake, while tagasaste can provide valuable protein to complement low pasture quality.

What farmers say about tagasaste

Greg Hart, Central Hawke's Bay:

"Our regenerative style of farming lends itself very well to pasture-tree combinations. Tagasaste is one of the nitrogen-fixing trees which we use in combination with others to provide a variety of benefits to the farm. It is fast growing and provides shelter for livestock, as well as being there as a feed source if needed."

Nick Broad, Wairoa:

"I'm looking for shade, shelter and erosion control on my hills. Tagasaste is a tree which can do this while maintaining our carrying capacity and it's great to have the native birds around in winter."

Potential issues

Because of its drought tolerance, prolific seed production and longevity of seed in the soil, tagasaste can become a weed in disturbed areas, such as shingle riverbeds, north-facing banks and sand dunes. It is not frost tolerant, so unlikely to become a weed in high rainfall or frost-prone areas.

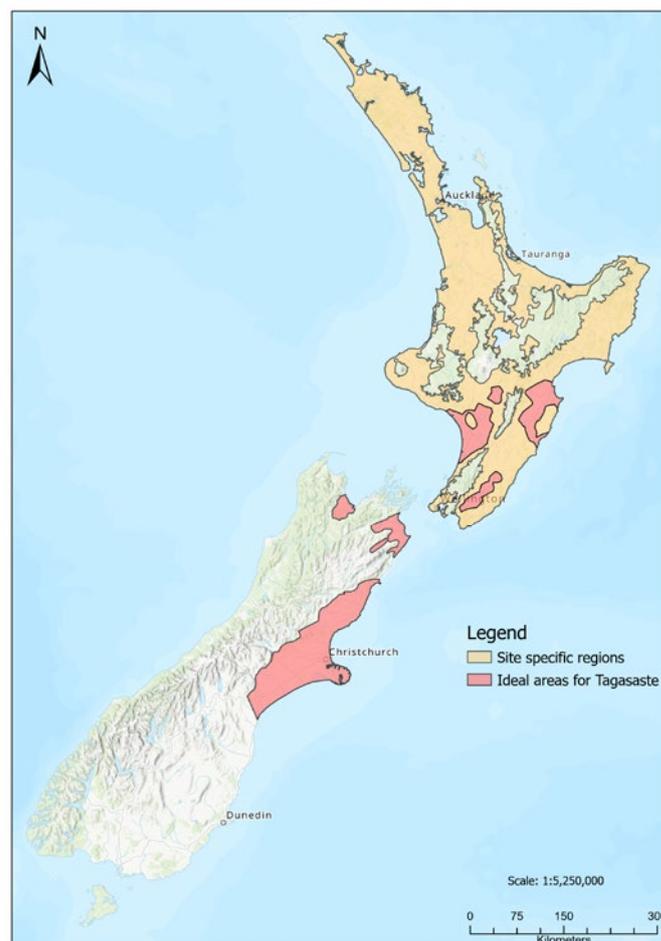
Where does it grow in New Zealand?

Tagasaste is best suited to drought-prone flat land and north-facing hill country with free-draining soils. It can tolerate high rainfall where soils are well drained, such as pumice soils. It will not tolerate waterlogged soils.

Tagasaste grows up to 400 m above sea level in the North Island and up to 200 m above sea level in the South Island. While seedlings are frost tender, mature trees tolerate frosts as low as -9 deg C.

The map below shows where tagasaste grows successfully.

- **Pink areas:** Annual rainfall is below 1000 mm. Tagasaste grows well, but is susceptible to frost-damage.
- **Yellow areas:** High rainfall. Tagasaste growth will be successful where soil types are well drained and heavy frosts are uncommon.
- **Uncoloured areas: microsites.** The remainder of the North Island and parts of the South Island have microsites where tagasaste can be grown, although many of these sites have either wet/heavy soils or are frost-prone.



Establishment cost and financial benefits

Tagasaste is best grown from seedlings. Individual trees can be protected by tree guards during their establishment. This enables the area to be grazed, pasture quality maintained and weeds controlled. Otherwise, areas of unprotected trees must be fenced to exclude stock for up to two years.

Cost/ha to establish

Unprotected trees: \$860/ha
Protected trees: \$5570/ha

Financial benefits on pastoral hill country

	\$/ha/yr
Feed value (comparable to lucerne hay)	\$114
Estimated value of N fixation*	\$62
Honey production	\$300
Soil conservation through reduced erosion	\$250
TOTAL ESTIMATED BENEFIT	\$726

* Based on a case study on a Wairoa farm. Note, estimated benefits may differ depending on location.

Establishing tagasaste

Establishing tagasaste via transplanting is much more successful than direct seeding*.

Tagasaste establishment can take 12-24 months during which time it cannot be grazed.

* For information on tagasaste seed collection, germination and direct drilling, see the Resources section at the foot of this factsheet.

Plant spacing

	Planting distance (metres)	Stems/hectare	Planting formation
Forage - to be trimmed	4-6	400	Evenly spaced
Forage - untrimmed	8-10	120	Evenly spaced
Shelterbelt - single row	1-3	Not applicable	Single row
Shelterbelt - double row	2-3 within row; 1-2 between rows	Not applicable	Off-set the two rows
Erosion control	8	156	Evenly spaced

Site preparation

- 1) Brushweeds (e.g. blackberry and gorse) may require repeat herbicide applications up to six months before tagasaste establishment.
- 2) Remove resident vegetation by hard grazing with livestock.
- 3) Correct soil nutrient deficiencies. Aim for a pH of 5.0-6.0 and Olsen P \geq 20.
- 4) Approx. 3-5 weeks before transplanting, spot spray 1 m² patches in readiness for the seedlings.



Transplanting seedlings

Several nurseries around New Zealand sell tagasaste. The easiest way to find a nursery near your location is to google "tagasaste".

Area's characteristics	When to plant
Frost free	Autumn
Frost prone	Late spring
High rainfall	September/October

Steps:

- 1) Harden-off the seedlings before transplanting. Do this by gradually exposing them to outdoor conditions over a couple of weeks.
- 2) When seedlings are 30-50 cm tall and supported by healthy roots, plant into well-cultivated holes.
- 3) Trim taller seedlings to 30-75 cm to encourage branching.
- 4) Control weeds by hand or herbicide application.
- 5) Manage animal pests (such as hares, rabbits, possums and goats) with baits, net guards, sleeves or chicken mesh. Apply slug bait.

Management of tagasaste stands

UNDER GRAZING

Establishment: Unprotected trees within a fenced area

Stock must be excluded for up to two years, while the stand establishes. You can then carefully graze with lambs or hoggets.

After three years, most trees will tolerate sheep browsing; after 4-5 years, the trees should be able to withstand grazing by young cattle.

However, for the first five years, it is important to monitor for damage whenever you graze with livestock. Trees must not be ring-barked.

Establishment: Trees protected by tree guards

For the first 2-3 years, carefully graze the pasture between the protected trees with sheep or young cattle.

Mature stands

Graze stands intermittently and lightly with cattle or sheep. Remove no more than 80% of leafy material, as this level of grazing maintains leafy regrowth.

Ideally, keep the tagasaste grazed/trimmed so it remains vegetative. Once seed pods mature, the forage becomes unpalatable until autumn.

Do not graze continuously, as livestock may ring-bark and kill the plants.

Use electric or permanent fences to protect the main trunks and allow livestock to eat protruding branches.

To maximise regrowth and forage utilisation, cut vegetation that has grown above the reach of livestock.

CUTTING FOR FODDER

Tagasaste used for fodder can be trimmed for two reasons:

- 1) To remove individual branches for grazing livestock (cut and carry/cut and drop), and
- 2) To remove vegetation that is above grazing height, so the plant develops a shape that maximises utilisation.

Tagasaste can be trimmed using a chainsaw or loppers. Trim trees 1.5 m above the ground to keep the regrowth within grazing height.

Trim the trees up to four times each year. Trees can be trimmed more frequently during summer until early autumn; less in winter, when growth slows.

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Tagasaste shrub ready for grazing. At this height (1.5 m), branches are within livestock reach for grazing.



Tagasaste shrub after grazing. Approximately 80% of the green leafy vegetation has been removed. It is important that livestock do not remove all the green leafy vegetation. If too much vegetation is removed and livestock ring-bark the branches, the shrub may die.

Conclusion

Within New Zealand hill country systems, tagasaste is best used as a browse species to supplement a pasture-based diet. In this way, the pasture intake minimises any potential negative impacts of tagasaste's condensed tannins, while the tagasaste's protein content complements a low-quality pasture. Tagasaste can provide valuable drought feed, shade and shelter for livestock, and a forage source for bees and native birds.

Tagasaste requires careful management to prevent it from being overgrazed. The plant favours drought-prone land, particularly north-facing hill country with free-draining soils. Tagasaste will die when grown in soils that are regularly waterlogged.

RESOURCES

B+LNZ Knowledge Hub - www.knowledgehub.co.nz

 **Handbook: Growing Tagasaste in New Zealand**
Search "tagasaste".

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