



A collaboration between AWI, GRDC, MLA, RIRDC and Dairy Australia

Chicory

Scientific name(s)

Cichorium intybus

Strengths

- Palatable and nutritious.
- Rapid establishment and high first year productivity.
- High animal growth rates.
- Fast regrowth in warmer months.
- Adapted to acid soils (replaces lucerne).
- Deep root system capable of extracting water and nutrients from depth.
- Not known to cause bloat.
- Persistent under moderate grazing.
- Regenerates readily if allowed to seed.
- Retains leaf better than lucerne in dry conditions.
- More drought tolerant than plantain.

Limitations

- Susceptible to trampling and overgrazing
- Requires high levels of nitrogen for maximum production.
- Does not make good hay
- Poor growth rates at low temperatures
- Herbicide options are limited.

Plant description

Plant: Broad-leaved perennial with thick, deep taproot, belonging to the daisy family. Prior to flowering, it produces one or more basal rosettes of large, soft, lush leaves with short stalks. On flowering, it develops into a sprawling bush over 1 m high. Plants typically survive for 2 - 3 years, and up to 5 years in higher rainfall areas with careful management.

Stems: In late spring, stiff spreading flowering stems emerge from the leafy crown, growing to a height of 1.5m. They are hairy, hollow, branching and sparsely leafed, exuding a milky sap if cut.

Leaves: Rosette leaves are 5 - 15 cm long, oblong or lance-shaped, and covered with rough hairs on both the upper and lower surfaces. Leaf margins vary with cultivar. Stem leaves are much smaller.

Flowers: Blue daisy flowers 25 - 35 mm across.

Seeds: The seeds are about 3mm long, dark brown, wedge-shaped, and 5-angled

Pasture type and use

Chicory is used as a short and medium term forage, and is an alternative to lucerne in areas where soils may be too acid for lucerne. Valuable for finishing livestock and promoting weight gain. Can be used in dryland or irrigated pastures. Will tolerate some shading, and has been used as a cover crop in vineyards.

Where it grows

Rainfall

Chicory is adapted to a wide variety of climates, from summer dominant to winter dominant

rainfall areas, receiving 400 mm to 800 mm annual rainfall. It requires some summer rain or irrigation over summer to perform best.

Soils

It prefers well drained, deep, fertile soils, but will grow on heavier soils providing they are not prone to waterlogging for extended periods. While it grows best on slightly acid to neutral soils, it is moderately tolerant of acid soils down to a pH(CaCl₂) 4.2.

Temperature

Moderate to high frost tolerance.

Establishment

Companion species

Grasses: annual and perennial grasses

Legumes: lucerne, annual legumes such as subterranean clover or balansa clover

Other: plantain (in coastal regions)

Sowing/planting rates as single species

4-5 kg/ha if sown alone. Not normally sown alone, usually combined with a legume

Sowing/planting rates in mixtures

2-5 kg/ha chicory with 0.5 kg white clover or 0.5-1kg/ha red clover as specialist forage in higher rainfall areas 1-2 kg/ha chicory when combined with lucerne, perennial grasses, or sub clover. When sown with lucerne can reduce the risk of bloat. Should be sown at a depth of no more than 1 cm. (shallower is best)

Sowing time

Can be sown in autumn or early spring (in longer growing season districts)

Inoculation

Not applicable

Fertiliser

Requires phosphorus, sulphur and nitrogen. Can also be sensitive to B deficiency in limed soils.

Management

Maintenance fertiliser

Annual dressings of superphosphate. Apply nitrogen if no companion legumes sown.

Grazing/cutting

Rotational grazing management is the preferred option for persistence. Plant height should be maintained between 5 cm and 40 cm. Grazing pressure in summer can be manipulated to promote leaf growth and delay stem elongation and flowering, or to encourage flowering, seed-set and regeneration. Heavy grazing in late autumn and winter can reduce persistence if there is insufficient leaf growth to replenish root carbohydrate reserves.

Grazing, slashing or cutting just prior to prolonged rainfall should be avoided as this can result in stem disease and increased plant mortality. Plants are susceptible to damage from trampling and overgrazing, particularly when dormant. Chicory makes good quality silage but does not make good hay as leaves are brittle and break up on drying.

Seed production

Chicory flowers during summer after a chilling period in winter. Spring-sown chicory does not usually flower in the first year unless plants experience sufficient cold weather. It can produce large numbers of seed if allowed to go to head in summer, resulting in large numbers of seedlings.

Ability to spread

Can regenerate from seed under some circumstances but does not spread widely.

Weed potential

It is unlikely to become a weed since plants tend to be short lived, it is restricted to moderately fertile soils and is highly palatable and readily grazed.

Major pests

Attacked by earth mites and white fringed weevils, although damage is usually not serious. Slugs can cause significant damage and crop failure particularly in direct-drilled germinating crops.

Major diseases

Charcoal rot and sclerotinia rot. It is advisable not to sow chicory after sclerotinia-susceptible crops, such as pulses, lucerne, canola etc.

Herbicide susceptibility

Susceptible to many broadleaf herbicides. Always check label before herbicide use. Best sown into weed-free pastures.

Animal production

Feeding value

Has a good balance between crude protein, energy and minerals resulting in rapid passage through gut and very high feeding value. Dry matter digestibility ranges from 66 - 80%, metabolisable energy from 9 - 11 MJ and crude protein from 14 - 24%.

Palatability

Highly palatable.

Production potential

Very valuable for finishing livestock and promoting weight gain. Capable of producing high growth rates in lambs (290 g/day) and calves (900 g/day). Also useful for flushing ewes to promote ovulation.

Livestock disorders/toxicity

Some varieties have high levels of lactucin, which causes milk taint when chicory is fed to dairy cows, particularly where it forms more than 50% of the diet and is grazed too soon before milking. See 'Choice' under "Cultivars".

Leaves have been reported as poisonous to pigs and roots poisonous to cattle but these incidents appear to be rare. There are no reports of poisoning under Australian conditions. Does not cause bloat in cattle due to its high condensed tannin content.

Cultivars

Both longer living and short-term cultivars are available.

Cultivar	Seed source/Information
Puna	Wrightson Seeds
Puna II 	Wrightson Seeds
Commander	Heritage Seeds
Grouse	PGG Seeds
Choice	PGG Seeds
INIA Le Lacerta	-
Chico	Cropmark Seeds
Forager	Wrightson Seeds

 Denotes that this variety is protected by Plant Breeder's Rights Australia

Further information

NSW Department of Primary Industries - Chicory Agnote DPI-398

Acknowledgements

Information has been adapted from NSW Department of Primary Industries Agnote DPI-398

Author and date

Brian Dear NSW Department of Primary Industries.
Brett Upjohn, NSW Department of Primary Industries.
Andrew Craig, SARDI

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