

# Chicory For High-Quality Pasture

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**C**hicory root has long been used as a substitute for coffee (it is still mixed with coffee in New Orleans) and a closely related species, endive, is used as a salad vegetable. Chicory has been a desirable common weed component in European pastures for a long time. However, yields were low and it was neglected until a plant breeder in New Zealand, Dr. Bill Rumball, recognized its potential and developed a variety with twice the yield of common types. This variety, named 'Puna', has been widely adopted for pasture use in New Zealand and is increasingly being planted in the USA. Research on chicory has been conducted in Georgia for the last three years. Results of this work and recommendations on chicory are presented here.

## What does it look like?

Puna chicory is a perennial forb (neither a grass or legume) with a low-growing rosette in winter, much like a giant dandelion. With warmer temperatures in spring it produces large numbers of broad succulent leaves from the crown. Dense leaf growth continues from spring through summer into late autumn if adequately fertilized. In late spring and summer, a few flower stems develop from the crown and will reach 4 or 5 feet if not grazed or cut. Chicory has a thick deep tap root that reaches deep into the soil, even when very acid, allowing it to extract water and making the plant highly tolerant of drought.

## What is the nutritive quality of Puna chicory?

Crude protein content ranges from 15 to 25%, depending on maturity. Digestibility or TDN is generally 70% or higher. These high values are well above that of tall fescue or bermudagrass in summer, suggesting that forage of this plant would be a valuable animal supplement. Chicory forage is high in calcium, magnesium, potassium, sodium,



*Puna chicory in bermudagrass sod during October of the second year.*

and sulfur. Puna chicory is highly palatable to cattle, sheep, and deer. It does not cause bloat. Animal performance on chicory has been excellent.

## How has Puna chicory performed in Georgia?

Forage yield trials were conducted on prepared land for three years at Blairsville, Calhoun, and Athens. Puna chicory averaged over 3 tons of dry forage/acre with 60 lb N/acre applied in late February, May, and September each year. Forage yields generally equalled or exceeded that of tall fescue and Matua prairiegrass. Stands of chicory and tall fescue were good after three years while Matua prairiegrass stands were poor.

Plant	Dry forage yield, tons/acre		
	Blairsville	Calhoun	Athens
Puna chicory	3.74	3.50	4.07
Penngrazer tall fescue	3.98	3.28	2.96
Matua prairiegrass	3.26	2.86	3.19

No-till planting of Puna chicory in tall fescue and bermudagrass sods has resulted in good stands with good production over a long period of the year. In an experiment at the Central Georgia Station for the last two years, production of Puna chicory was compared with tall fescue and rye no-till planted in bermudagrass and harvested monthly. Nitrogen at 60 lb N/acre was applied in February, April, and September. During winter, rye was far superior to chicory or tall fescue while during spring chicory equalled that of tall fescue (see graph). Summer production of chicory was superior to tall fescue or bermudagrass. The dense wide leaves of chicory resulted in heavy shading so that bermudagrass growth was low. By autumn, the forage consisted entirely of chicory. Total season yield of chicory and bermudagrass was 4.6 tons/acre. Stand persistence of chicory was good during two years with the cutting management used in this experiment.

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The long productive season of chicory and substantial summer growth indicate that it might be useful to improve the nutritive quality of bermudagrass pastures during late summer. In other trials, no-till planting of chicory in tall fescue sod is also promising although greater grass competition in spring reduces chicory growth. Water content of chicory is very high so it would be very difficult to make hay from this crop.

### Grazing management of chicory

In trials at the Central Georgia Station near Eatonton and the Northwest Station near Calhoun, chicory has persisted well in both tall fescue and bermudagrass when grazed closely and continuously from spring to late autumn. When subjected to clipping every 3 weeks at a stubble height of 1-1/2 inches in an experiment near Athens, stands persisted well over two years although yields were lower than when clipped every 5 weeks.

Research in other states indicate that the best way to graze chicory is rotationally to allow a rest period of 3 to 4 weeks for regrowth. This is also desirable for chicory no-till planted in bermudagrass sod to prevent cattle from selectively grazing the highly palatable chicory in preference to bermudagrass, especially in late summer. Maintaining cattle continuously on a mixed chicory-grass pasture will likely result in overgrazing of chicory with reduced vigor and future growth. Failure to

remove stalks will reduce leaf production. Ungrazed seedstalks in summer should be mowed off to stimulate new leaf growth. Nitrogen fertilization is essential for good chicory growth.

### Planting of chicory

Puna chicory seed is available. Planting should be done at 4 to 5 lb/acre and a seeding depth of 0.5 inch or less in autumn to allow good establishment over the winter. Soil test and fertilize as recommended. Lime should not be needed in most cases. Apply nitrogen to stimulate establishment. Do not graze chicory until it is 6 inches tall to allow good development of roots.

### Opinion

Puna chicory is a promising perennial forb that can supply high-quality pasture during summer when nutritive quality of perennial grasses is often low. It is highly competitive with grasses and weeds, tolerant of drought and soil acidity, and grows over a long period of the year, and is relatively easy to establish. However, chicory is not a low-input pasture crop as it requires several applications of nitrogen each year and some rotational grazing for good productivity. For livestock producers who would like a high quality summer grazing plant in perennial pastures and are willing to manage chicory, it may be worth planting a small area.

SEASONAL FORAGE PRODUCTION OF CHICORY(C), TALL FESCUE(TF), AND RYE(R), NO-TILL PLANTED IN BERMUDAGRASS(B), 2-YR AVG. CENTRAL GEORGIA BRANCH STATION.

