

# Chicory

## A Powerful Perennial



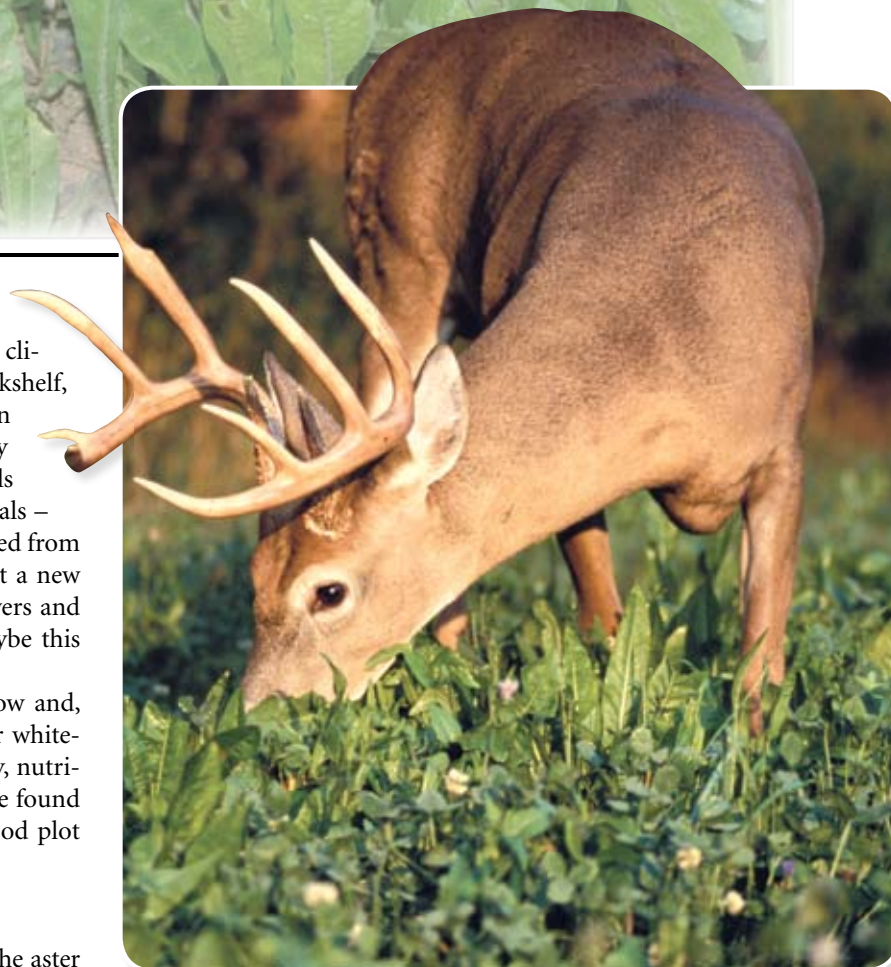
By Rans Thomas

A few planting seasons ago, I was visiting with a client in the Southeast. As I glanced over his bookshelf, I noticed among hunting and outdoor books one title in particular – “Perennials.” I thought to myself, “Now, this guy has got it together. He is already reading about perennials for food plots.” Then I noticed the book’s full title: “Perennials – a Southern Celebration of Foods and Flowers.” It was misplaced from his wife’s cookbook collection. Oh well, maybe I would spot a new recipe. As I flipped through the book, I saw among the flowers and plants one of my favorite forage plot species – chicory. Maybe this book wasn’t so misplaced after all.

I have been planting chicory in food plots for years now and, time and again, have witnessed this plant’s attractiveness for white-tails. Only recently have I come to fully appreciate this hardy, nutrient-rich herb for the powerful food plot perennial it is. I have found myself including it in almost every... no, *every* perennial food plot I plant or prescribe.

### PLANT DESCRIPTION

Chicory (*Cichorium intybus*) is in the family Asteracea, the aster or sunflower family. It is also commonly known as “blue sailor,” “succory” and, ironically, by the same name as an arch enemy to all Southeastern plot hounds – “coffeeweed.” Coffeeweed is also the common name for sicklepod, a highly invasive summer annual weed that is extremely hard to combat. There are four to six wild species



CHARLES ALSHEIMER

*Chicory is drought-tolerant, nutritious, grows in a wide range of conditions and mixes well with legumes like clovers. It's also very palatable and attractive to whitetails and would make a great addition to your fall food plots this year.*

of chicory, one of which can be found in the Midwestern United States, and two major, improved cultivars that are currently being imported and made available in the United States for forage production – Forage Feast and Puna chicory. More about these and other varieties later in this article.

Chicory foliage looks similar to plantain and dandelion. Some leaves will have smooth edges and look like a tongue while others can be deeply serrated. This is a variation found in almost every variety, and leaf shape may change with plant maturity. Smooth-edged leaves are much more common. The flower is often light blue but can be pink or white, each with a serrated lip or edge. After the plant's first winter, a flowering stem will "bolt" in the spring to midsummer and can reach 6 feet in height. The seeds are very small at just under 1/8 of an inch long and shaped like an elongated triangle.

Chicory's tap root can grow very long and is similar in shape to a carrot, although longer, at full maturity. It has been found that the root can actually penetrate moderate hardpans, a compacted layer of soil about a foot below the surface that can stop most root growth. However, if you have hardpan problems, it is best to fragment this layer by sub-soiling with the right equipment, such as a moldboard plow, before planting (for more information, see "Deep Impact" by Brian Sheppard in the March 2004 issue of *Quality Whitetails*).

The length and diameter of chicory's root gives the plant one of its many desirable traits – the ability to take hold in sandy soil and reach deep moisture during periods of drought.

Chicory's origins can be traced to the Mediterranean Sea, more specifically France and Italy. It's also believed to have originated in eastern India as it was referenced in writings of the ancient Greeks. Although it contains no caffeine, chicory's French origins place it in south Louisiana where it is used as a coffee substitute to this day. It was introduced in the United States in the late 1700s and was commonly used as a coffee substitute in the field by Civil War infantrymen. During World War II, coffee came into short supply, and chicory was once again widely used as a substitute. I've also read of its use in the Appalachian Mountains as a coffee substitute and a treatment for digestive disorders because of its ability to increase bile production. Chicory has been used commercially in different countries for 300 years but not until it found its way to New Zealand was it devel-



*Chicory's sturdy tap-root (above) helps it take hold in loose or sandy soils and reach deep moisture during dry periods. The root is also capable of penetrating hardpans beneath the soil surface. The leaves of chicory vary between serrated (shown on the left) and smooth forms (shown on the facing page).*

oped and improved for use as fodder, forage and more recently for deer food plots.

Leave it to a bunch of deer managers to bring a plant originating in Europe and India, written about by the Greeks, and used as coffee, herbal medicines and salad to the world of deer food plots!

#### NUTRITIONAL QUALITIES

Recently chicory has been found to have some interesting and even mysterious attributes when consumed by small ruminants such as sheep, goats and deer. Mark Thomas with Barenbrug USA told me that it seems to reduce parasites in sheep that graze on chicory in New Zealand.

"Sheep are wormy critters and need to be treated with deworming medications every month when grazing in standard grass and legume pastures," Mark said. "However, when sheep graze on pastures where chicory is present, we have found they only need worming once a year. This may be due to the condensed tannins that chicory contains, but we can't say for sure yet."

Dr. Richard Watson, Extension Forage Specialist with Mississippi State University, added to these comments.

"Chicory contains lactones and lactucin which are secondary metabolite alkaloids, and in combination with chicory's 5 percent tannin content makes chicory forage inhibiting toward certain parasites, namely worms."

"In addition to its overall high nutritive value, chicory

*Continued.*

#### **Chicory at a Glance:**

- **3- to 7-year perennial.**
- **10 to 35 percent crude protein and 95 percent digestibility.**
- **High nutrient and energy levels.**
- **May improve protein utilization in ruminants.**
- **Great companion to numerous plot plants, especially clover.**
- **Tolerant of grazing pressure and sandy soils.**
- **Tolerant of soil pH as low as 4.5 (but still work to correct the pH!).**
- **Extremely long taproot that can find water during a drought.**
- **Can be sprayed by most post-emergent grass-selective herbicides.**
- **Attractive and highly nutritious in both the fall and spring.**



*Chicory should be mowed in spring when the stand reaches 6 to 8 inches in height to keep it in an early growth stage for better forage production and less “bolting.” Mowing to a height of 4 to 6 inches is acceptable, in fact recommended, if clovers were planted in a mix with the chicory. The clover/chicory mix shown above has just been mowed for maintenance.*

also contains other secondary compounds such as condensed tannins, that contribute to the feed value,” said ruminant nutritionist Annette Buyserie, also with Barenbrug USA.

Chicory is relatively high in condensed tannins compared to most food plot plants on the market and may actually improve protein utilization efficiency in ruminants. This has been shown in sheep. When ruminants consume forage or feed, the crude proteins are broken apart by microbes, or “rumen bugs,” and rebuilt into microbial proteins. Microbial proteins are an exceptional source of high-quality protein for ruminants. However, the process of protein synthesis is dependent on many factors and can often be highly inefficient, especially when the animal’s diet does not contain adequate energy levels. Select forages containing around 5 percent tannins have improved the efficiency of protein utilization by binding some of the proteins and protecting them from being broken down in the rumen. The net effect can be an increase in the quantity of amino acids absorbed by the ruminant to support maintenance and production. However, condensed tannins are a very diverse group of chemicals, and not all of them are fully understood. Some research also shows that condensed tannins can cause protein to pass completely out of the animal without being digested. It could be that levels of condensed tannins higher than 5 percent result in such negative effects, but more research is needed, particularly where improved varieties of chicory are concerned.

The word tannin usually sends up red flags for deer managers for another reason – high levels of tannin compounds in vegetation, grains or mast can make them unpalatable to deer. Again, research indicates that at or below 5 percent tannin content, plants like chicory still remain palatable to deer.

I sometimes get reports of healthy chicory stands that are not being browsed by deer at normal or even above normal deer densities. As with any plant, this could be due to deer being unfamiliar with the forage or due to low soil fertility or pH. However, certain varieties of chicory may also have tannin levels that touch or cross the threshold of palatability. There is much to be learned about the role of condensed tannins in whitetail nutrition, but there are strong indications that planting forages like chicory that have moderate levels of tannins could have positive impacts on deer health.

#### **PLANTING CHICORY**

Chicory seed is very small and should be planted no more than ½-inch deep at a rate of 3 to 4 lbs./acre alone or 1 to 2 lbs./acre in a blend. Chicory can be planted in the spring or the fall, but I only recommend fall planting in the South. However, spring plantings can be very effective in the central and northern United States. Like most perennials, chicory is slow to establish. Without optimum conditions, you may not see leaves emerge for a few weeks, so a spring planting in the South can leave the crop vulnerable to weeds, drought and browsing before it establishes. Chicory can be broadcast and lightly covered or cultipacked. It can also be drilled, but be very careful about planting depth. The most effective method for drilling is to apply the chicory through a small-seed box if the drill has one. If not, and you are planting a blend of multiple seeds of different sizes, I have had good luck broadcasting the chicory first mixed with fertilizer, pelletized lime or even sand, and then drilling in the larger-seeded species using the drill’s disturbance to lightly cover the chicory seed. If planting a pure stand of chicory, use a fertilizer analysis with 10 to 20 pounds of nitrogen per 100 pounds of fertilizer (19-19-19) applied at a rate of 300 to 350 lbs./acre. If planting with properly inoculated legumes, you can use a lower rate of nitrogen and let the legumes (once firmly established) provide the nitrogen for you. If you plant a stand of chicory without a legume, top-dressing with ammonium nitrate or ammonium sulfate (100 lbs./acre of 34-0-0) will be necessary in the spring, summer and fall. Chicory is tolerant of lower pH levels, however, don’t skimp on liming because of this tolerance. Chicory, like almost all other food plot plants, performs best in soils with a pH of 6.0 to 7.0.

#### **CHICORY IN BLENDS**

Because of chicory’s need for nitrogen, I highly recommend planting it with a companion legume. Chicory with perennial white clover is a terrific mix for almost all temperate zones. For the central and northern United States, chicory makes a great companion for alfalfa. For planting in sandy soils, I have even blended chicory with burgundy beans, a viny summer legume that does well in sandy soil and can perennialize in the Deep South (refer to Kent Kammermeyer’s *Species Profile* in the June 2006 issue of *Quality Whitetails*). Yuchi arrowleaf clover is also a great

companion legume to chicory for sandy soils. Yuchi is not a perennial but may last well into June and will reseed well with light disking in late August if you did not mow it before it went to seed.

For fall planting in the South, I recommend a blend with clovers, cool-season annuals such as cereal grains, and Austrian winter peas. While the chicory is taking some time to establish its root system and emerge, the cool-season annuals will be up in a few days, providing nutrition and attraction and screening the slowly emerging perennials that first fall.

If you have established stands of perennial clover, you can always improve them by incorporating chicory into them with a no-till drill or by very lightly disturbing the soil with a disk harrow and broadcasting. Be careful not to do this during a drought or to disk too heavily, as you could damage your clover stand beyond repair. Align the disk gangs on your small disk harrow with the direction of travel so the disks roll and slice through the clover stand, leaving light furrows, then broadcast the chicory over the plot. Try to plant when rain is in the forecast. With rain, enough seed will find the exposed soil and furrows and take hold.

#### MAINTENANCE

Whether planted in the spring or fall, chicory will not mature and “bolt” until the spring after planting. It is at this time that proper maintenance is critical. Depending on your region, the spring flush of leaf growth may occur from early April to early June. It is important to mow the stand before leaves reach 6 to 8 inches in height and to maintain the stand at 4 to 6 inches. This will also work fine for all blends with clover and alfalfa.

Spring mowing of a blend with burgundy beans should not occur until the burgundy beans grow taller than the 4- to 6-inch height due to its intolerance of mowing.

The next mowing should occur in the fall unless the chicory bolts in the summer, at which time mowing will be required. With the Puna variety this is uncommon. Mowing will also help control summer broadleaf weeds and keep many of them from seeding and compounding problems.

There is no post-emergent herbicide labeled for spraying over chicory to control broadleaf weeds. Chicory can be sprayed with almost all post-emergent grass-selective herbicides. My favorite is Poast Plus, but Select, Advantage and Aim work as well. Always read product labels and consult with your local county Extension agent before spraying. An early spring application may be beneficial if you planted heavy rates of cool-season cereal grains the previous fall or if residual cool-season grasses like annual ryegrass have established in the stand. These grasses will begin to mature as spring advances and compete with the chicory for nutrients and water. This is especially true if your plot includes clovers.

#### INTERESTING FINDINGS IN THE FIELD

Cliff Grant, the lease manager for The Langdale Company in south Georgia, was very successful growing chicory in the sandy soils of his region. Recently, Cliff called to tell me that something was digging up his chicory. After a close look, it became evident to us that deer were digging down and eating the tops of the chicory



tap roots. I'm sure this incident was due to a limited number of plots and high deer densities, and made possible by loose soils, but the attraction stands to reason – chicory root has also been found to contain 20 percent inulin, an alternative to sucrose. Researchers are currently evaluating this chemical as a low-calorie sweetener. Maybe they should evaluate what Cliff's deer think about the sweetness of these roots!

#### CHICORY VARIETIES

There are only a few major companies active in research, development, and production of chicory varieties and selections in New Zealand. According to Dr. Richard Watson, AgResearch Limited is a New Zealand company that is strictly involved with research and development of chicory technology. Dr. Bill Rumball with AgResearch developed Puna chicory, from which he then created the Choice and Oasis varieties. These are now licensed with PGG Wrightson Seeds, a leading breeder of New Zealand forage plants. Wrightson Seed owns the U.S. license to Puna, Choice and Oasis chicory and sub-licenses and provides the seed stock to Barenbrug USA and AMPAC Seed Company, the leading chicory distribution companies in the United States.

**Puna** (Grasslands Puna) – Puna was developed in New Zealand by AgResearch. It is currently being grown as far north as Alberta Canada and as far south as northern Mexico and central Florida, proving that it is more widely adapted than most other varieties. It is resistant to bolting, which leads to higher spring nutrient levels in the leaves. It is also improved for resistance to grazing pressure, which can be very important in small plots. It is also an excellent companion to clover.

**Forage Feast** – A European variety from France that is very common and widely used for wildlife plots. It is very cold hardy and similar in most attributes to Puna; however, because of its selectivity for the food industry, it is lower in tannins than Puna and in some cases more palatable to whitetails in test-plot studies. This variety, as well as Puna, is found in most Tecomate Seed perennial blends.

**Choice** – Improved from the Puna variety by Dr. Bill Rumball, Choice is bred for higher winter (early spring) activity. It was bred for lower rates of lactucin and lactone for the dairy industry, compounds believed to taint the milk. This is a variety found in Pennington's Rackmaster blends.

**Oasis** – AMPAC's licensed, AgResearch-improved Puna variety. Bred for increased lactone rates for the forage industry. It is believed that lactones give chicory its anti-parasitic attributes, but in the dairy industry it is frowned upon. Oasis is also bred for higher resistance to fungal diseases like sclerotinia.

**Puna II** – Considered to have greater persistence and longevity. This variety is in most Pennington blends.

**Grouse** – A New Zealand variety considered a better companion to brassicas; however, it is also thought to have higher rates of bolting and higher crowns susceptible to overbrowsing.

**Six Point** – This is actually a variety produced here in the United States and is very similar to Puna.

**INIA Le Certa and La Ninia** – Although chicory is known as

a perennial in the United States, these two varieties from Uruguay are used as annuals because they do not persist in climates north of their native range. These varieties are very useful for food plots where conditions are too hot and dry to grow perennials, like south Texas or anywhere double-cropping of annuals is preferred. These varieties are used in Tecomate Seed's annual blends.

**Chico** – A short-term cultivar better suited as an annual with very low spring and summer production levels. **Forager** is another variety that is very similar to Chico.

Other varieties that have appeared recently include **WINA-100**, introduced by the Whitetail Institute, and **Plot Enhancer**, offered by AMPAC Seed.

Many varieties claim to be genetically improved for deer, but whether each variety that claims this has actually been significantly improved is up for debate. According to Dr. Richard Watson, it has taken as much as a decade of selection and breeding to develop even slightly improved varieties of chicory.

As with any food plot product, be a thorough researcher and scientist – if you are uncertain about any variety, ask the company



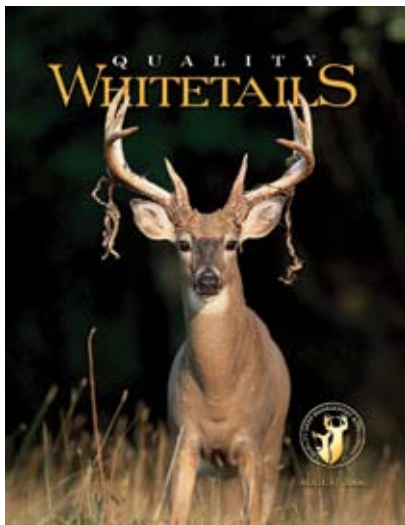
*To cap off its positive attributes, chicory is palatable and attractive to whitetails – this browse enclosure containing lush chicory tells the story.*

that sells it for as many details as they are willing to share about their research, breeding and testing programs. Ask other food plot growers what their experiences have been with certain varieties – the Forum at [www.QDMA.com](http://www.QDMA.com) is a great place for this research. Finally, conduct your own trials on your land and keep good records of production and use by deer – you'll find out for yourself which varieties work best for you.

If you've never tried chicory, add it to your food plot trials this year. This powerful perennial will almost certainly be a winning addition to your deer management program.



**About the Author:** Rans Thomas is a wildlife biologist and the Consulting Services manager for Tecomate Wildlife Systems, and he has more than 15 years experience managing private hunting lands. He received his associate's degree in wildlife and forest management from Abraham Baldwin Agricultural College and his bachelor's in wildlife management from The University of Georgia.



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