

# In Search of the Edible Acorn

by Donald Cobb

Man has been eating the acorn for millennia (Schneider 1990). Acorns are an excellent source of many nutrients, especially protein and beneficial oils (table 1). The nutritional value varies markedly among species (table 2). After man domesticated animals, he used acorns to feed his livestock, most notably pigs, sheep, goats, and cattle. All acorns are edible either raw or cooked, but because of their high tannic acid content, it can be difficult for humans to consume them without reducing or removing the tannic acid first. Fortunately tannic acid is water-soluble. Acorns can be soaked whole or ground into meal and then soaked in water for a period of time, which will leach out the acid. The soaking time is dependent on the size of the acorn or the coarseness of the meal, and the tannic acid content of the acorn. Many native cultures added wood ash, or high alkaline or iron clays to the soaking water, or directly to the soaked meal, to further lower the tannic acid content. The clays also chemically tie up tannins beyond changing alkalinity (Johns and Duquette, 1990).

As man began to cultivate cereal crops, his reliance on acorns became less and less. Today acorns are only eaten regularly in only a few, mostly mountainous, regions of the world in Korea, Japan, China, Turkey-Ukraine region, Portugal, Spain, Italy, and in the United States by native Americans (Bainbridge 1991, Schneider 1989). The eating

of acorns in these places has continued mainly because of traditions, or because of emergency food shortages. Many of these mountainous regions have impoverished soils and people (Schneider 1989).

## Searching out edible acorns

Why then should we be interested in finding "edible" (ie. low tannin) acorns? The earth's population is rapidly expanding and the earth's resources are rapidly being used up. The needs of building materials, fuel, and food



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*Fruits of Quercus macrocarpa, which can be found in many shapes and sizes over the extensive range of the species, often are among the most palatable of acorns.*

will expand with the increases in population. Oak trees can supply building materials, fuel, and food and are a renewable resource. If acorns could be eaten without extra processing, the nuts would be much more appealing as a food crop.

Oak trees grow in a wide range of different climatic zones and soil types. Various species grow in swamps, sand dunes, deserts, and rocky mountaintops. Many will grow in soils not suitable for most cultivated crops. In Europe, the oak grows north of the Arctic Circle. In Asia, it grows south of the equator.

Many of the earth's oaks are in the subgenus *Lepidobalanus*, which includes *Q. cerris* (Turkey oak), *suber* (cork oak), *ilex* (holly oak), *robur* (English oak), *alba* (white oak), and *dentata* (Kaiser oak) (Krussman, 1986). Numerous members of this subgenus will hybridize with each other. Another interesting feature of this subgenus is that individual trees in the various species will have acorns with a much lower tannic acid content (personal communication). Some trees produce acorns so low in tannic acid that they are palatable to humans without any processing. These trees are not common, but they exist. I have heard many stories, mostly from people who lived during the Great Depression, about finding and eating low acid *Q. alba*, *Q. montana*, *Q. lyrata*, *Q. stellata*, *Q. bicolor*, *Q. macrocarpa*, or *Q. virginiana* acorns while foraging the great outdoors for food or timber during their lifetimes.

In 1998 the edible oak registry of the Northern Nut Grower's Association was activated for the purpose of preserving oak trees with edible acorns. Edible oak trees were defined as hav-

ing acorns palatable for consumption by humans, without requiring the leaching out of the tannins first. We want the registry to become a vehicle or clearinghouse to promote the following goals and would welcome the assistance and ideas from the International Oak Society members and other interested persons. Our current goals are to:

1. Register and preserve oak trees with edible acorns
2. Register and preserve oak trees that have desirable characteristics for the breeding of edible acorns including trees with:
  - a. low tannic acid content
  - b. consistent high production
  - c. large acorn size
  - d. acorns high in sugar, oil, or protein
  - e. trees with disease and insect resistance
3. Set up a germplasm repository for oaks with edible acorns
4. Make the germplasm and registry available to the public
5. Solicit universities and others to conduct a long-term breeding program

To date, members of the committee and other interested individuals have been scouring the countryside looking for unique *Lepidobalanus* oaks, collecting acorns and tasting them. One of the most challenging difficulties is collecting the tasty low acid acorns ahead of the squirrels and various birds, many of whom enter the tree canopy to harvest the acorns that are still green. We are also growing oak seedlings from seed, or

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*Table 1* Relative chemical composition of acorns and cornmeal (from Bainbridge, 1984).

	Acorns			Cornmeal
	Bur Oak	Live Oak	Post Oak	
Water (%)	29.6	18.3	16.5	12.5
Protein (%)	11.5	9.4	9.4	1.9
Fat (%)	3.9	7.4	6.2	9.2
Carbohydrate (%)	79.5	77.5	79.3	74.4
Tannin (%)	0.7	0.9	0.9	?

## Edible Acorn . . .

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collecting scion wood for grafting promising species. Through word of mouth, we are getting leads about promising species. We have also started a registry of promising mast trees.

### We need your help

Now we request your help in searching for trees with low-acid edible acorns. We would appreciate it if, when the opportunity arises, you taste the acorns of any species in the Lepidobalanus Section of *Quercus*. If you find a low-acid acorn-producing tree, please take good notes as to its description and location so it may be relocated. Ripe acorns that have fallen from the tree may be stored to preserve their viability by putting them in a plastic bag and storing them in the vegetable crisper section of your refrigerator. If you pick them from the tree, they may be dried slightly before refrigerating. Do a taste test with some other people to see if they agree that the acorn is as low in acid as you think. If you think it is a good candidate,

please mail a minimum of 15 (more is better!) acorns, as well as several leaves and cups to facilitate identification, to members of our committee or to me. We will taste test them and if we think the tree has promise, we will try to get more acorns, and/or scion wood to preserve and/or propagate the tree.

We also would like to recruit an additional member to our committee who lives in United States Climate Zone 8 (Sunset Books), if any of you are interested. We are also looking for someone who could perform tannic acid analysis of the acorns, as well as people with breeding experience and/or interest. We would like to know if anyone has tried grafting full sized oaks onto dwarf oak rootstocks. Hopefully by working together we can propagate and promote this highly beautiful and useful tree in all its genetic diversity and our dream of tasty, nutritious, and bountiful acorn production can become a reality.

### References

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Component	Range
Water (%)	8.7 - 44.6
Protein (%)	2.3 - 8.6
Fat (%)	1.1 - 31.3
Carbohydrate (%)	32.7 - 89.7
Tannin (%)	0.1 - 8.8
KCAL/110 gms	265.0 - 577.0
KCAL/lb	1200.0 - 2620.0
Total Amino Acids mg/g	20.77 - 24.84

Table 2. Nutritional value of acorns from 18 oak species (from Bainbridge, 1991).