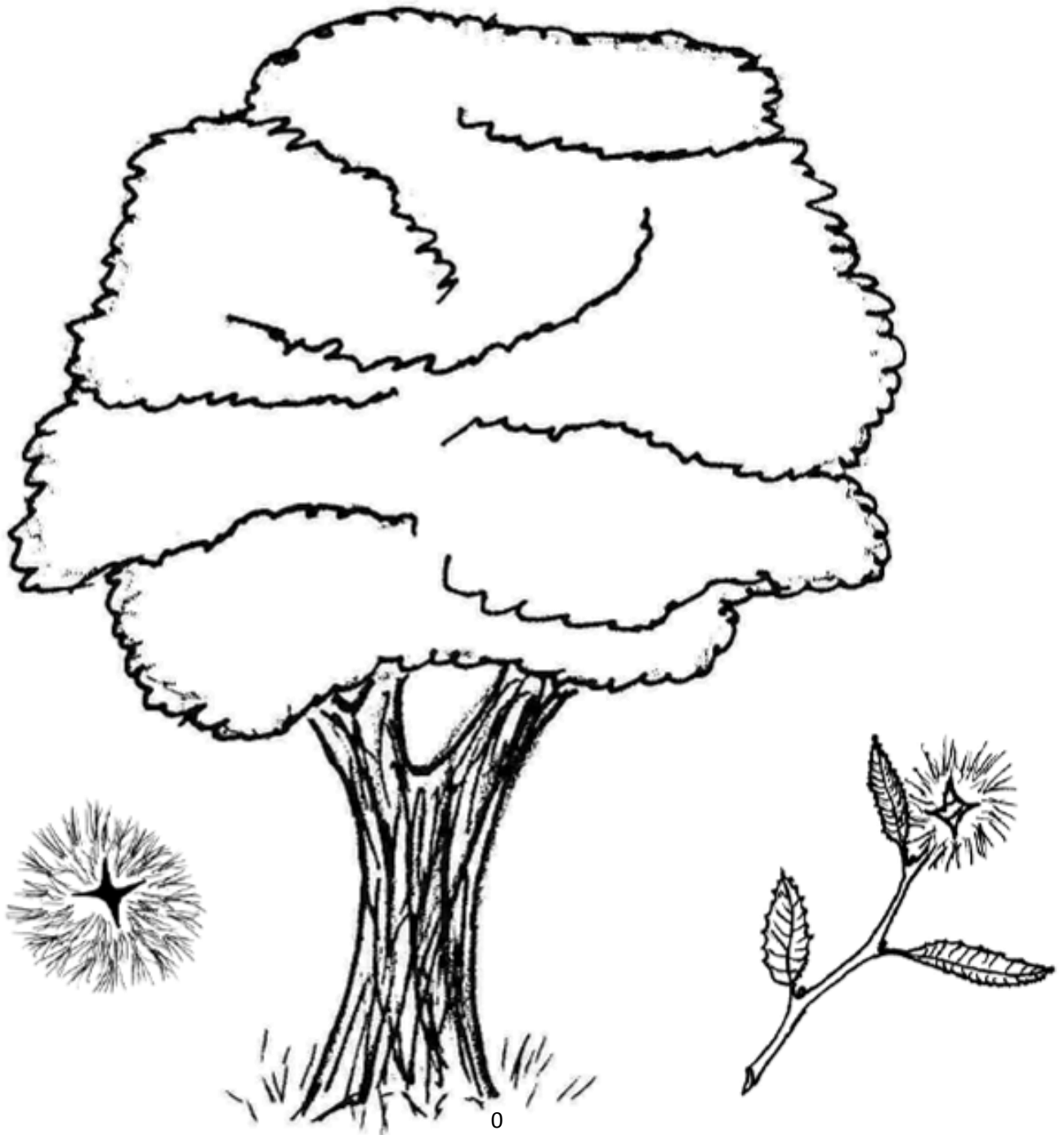


The Iowa Chestnut Grower's Primer

Written and Illustrated by Tom Wahl

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2nd Edition



The Iowa Chestnut Growers' Primer

Introduction

This primer is designed to give the prospective chestnut grower basic background information about what is involved in successful chestnut production in Iowa. It will outline the minimum requirements of soil, climate, equipment, labor, and capital. Rural landowners should be able to use this information to help decide whether chestnut growing is feasible and desirable for them. This primer is not intended as a complete manual for chestnut production. Members of Chestnut Growers of American and Northern Nut Growers Association are available for helping prospective and novice growers with specific questions or problems. This primer was made possible by a grant from the Iowa Department of Agriculture and Land Stewardship, and with assistance from the Practical Farmers of Iowa. It was revised in 2017 with the help of Kathy Dice.

Background Information

Chestnuts are trees or shrubs in the genus *Castanea*, and are in the same family as oaks and beeches. They are not related to horse chestnuts (whose nuts are poisonous) or to water chestnuts. There are four species of commercial importance. The American chestnut of the eastern United States was once the most important species of tree in North America (Figure 1). They are the hardiest of all chestnuts. They can withstand temperatures as low as -50°F (zone 3). The American chestnuts were practically eliminated by the fungal disease called chestnut blight, between about 1910 and 1950. The nuts of American chestnuts are high quality and very sweet, but they are too small to be considered



Figure 1. Loggers standing at the bases of giant American chestnuts in the Appalachians. Photo courtesy of Forest History.

commercially important. The trees are so susceptible to the chestnut blight disease they are not feasible to grow commercially. The European and Japanese chestnuts and their hybrids collectively make up about 25% of the chestnuts in international commerce. Their nut size is very large, but their quality and flavor are the poorest of all chestnut species. The European chestnut trees usually have little or no resistance to the chestnut blight. Japanese chestnuts usually have some degree of blight resistance. Both of these species are marginally hardy in zone 5.

Chinese chestnuts make up about 75% of chestnuts in world commerce. Almost all are grown in China, and almost all of those are sold in Japan. Chinese chestnuts are the most variable of all the species. The growth form may range from a low, spreading shrub to a tall timber tree. The nut size ranges from smaller than the Americans to larger than the largest Japanese and Europeans. The nut quality can be variable, but is usually quite high, and is not necessarily related to the nut size. The measures of nut quality such as flavor, appearance, peelability, kernel texture, and storage quality, are almost always superior in the Chinese chestnut when compared to the Japanese and Europeans. This species is variable in hardiness. Chinese chestnut trees from southern sources might not survive even one mild winter in southern Iowa. The hardiest can survive -40°F with no damage. Some Chinese x American hybrids can be so hardy as to survive -50°F.

The Chinese chestnut is the only species with enough resistance to chestnut blight to be commercially viable in the Midwest. Many are completely immune, and most are at least very resistant to the blight. Only a small percentage are susceptible. For the rest of this discussion, when we refer to chestnuts we are talking about Chinese chestnuts or hybrids with Chinese.

Chestnuts in World Commerce

The history of chestnuts as a commercial crop goes back at least 5,000 years. In all that history the supply has never been able to meet the demand. Chestnuts rank 3rd in demand (among nuts) in the world, behind only coconuts and peanuts. Demand for chestnuts exceeds the demand for almonds and all types of walnuts, combined. Chestnuts are the 3rd most economically important food crop in China, behind only rice and wheat, and ahead of corn and soybeans. All this suggests chestnuts are neither a fad nor a niche crop.

The U.S. imports over 40 million pounds of chestnuts per year. Only a few million pounds per year are produced domestically. Most of the imports are livestock-feed grade nuts from Italy. Besides being poor quality to begin with, most of these nuts are moldy or even rotten by the time they arrive.

It is reasonable to conclude high quality, good tasting, and locally grown chestnuts could out-compete and displace some of the poor quality but expensive imports. Growers in Southeast Iowa have been receiving \$1.30 (for the smallest nuts) and up to \$2.70 for good quality nuts at Prairie Grove Chestnut Grower's Cooperative in Columbus Junction, Iowa in 2016 (chestnuts must be delivered to coop before November 1st). Growers who direct market can receive up to \$3 to \$6 per pound. A surge in interest in chestnuts has resulted in many new plantings in the last

20 years. Even so, at the rate new chestnut plantings are going in, it will take over 100 years before there are enough acres to meet the demand in the U.S. as it exists today. Demand has been doubling every 10 years at least since 1980. In short:

- Demand for chestnuts is high, genuine, and long-term.
- There is no foreseeable danger of overproduction within at least the next 100 years.
- Prices paid for chestnuts have always been high, and are going higher.
- We can grow them in Iowa (and we are).

Chestnuts as a Cash Crop

Chestnuts have a lot of advantages as a cash crop for Iowa. Unlike most other nut crops, chestnuts tend to be heavy annual bearers (many other nut trees bear a good crop every other year, or even less). Worldwide, chestnut production tends to range between 1,000 to 9,000 lbs per acre. We are conservatively estimating production in Iowa to reach between 3,000 and 4,000 lbs per acre at maturity (it will probably end up higher). Net profits should range from \$6,000 to \$10,000 per acre annually. Chestnuts can be grown on land which would be marginal for other crops. A few other advantages:

- Chestnuts could easily be grown without chemical fertilizers or pesticides.
- They can be grown and harvested without expensive equipment.
- Chestnuts are long lived (1000+ years) so they only need to be planted once.
- Soil erosion from a well-managed chestnut planting should be at least 1,000 times lower than from no-tilled row crops.
- Chestnuts can be profitable even on a small scale. A farm family could earn a very good living on as few as 10 acres.
- Chestnuts have great potential for strengthening or even rebuilding rural communities.

There are a few serious disadvantages to chestnuts as a cash crop:

- Chestnuts require a considerable investment in capital and labor up-front, just to get them established, then there is no significant return for at least 5 years (average about 5-9 years to first significant harvest).
- Marketing requires some effort and ability (unless you market through a cooperative). You can't just take them down to the local elevator.
- The crop is perishable. It must be harvested every day for a month, and then kept in refrigeration until sold.

This primer is intended to help prospective chestnut growers weigh the advantages and disadvantages, and decide whether chestnuts will be a good choice for them.

Successful Chestnut Growing - What Does It Take?

Before going any further it should be stated that nothing in this primer should be interpreted as a recommendation to plant a large monoculture of chestnuts. Large monocultures of anything

(including corn and soybeans) are invitations to pest and disease. They usually require a great investment in energy, labor, and chemicals to maintain, and will probably fail in the end anyway. There are a number of other high-value tree crops which could be inter-planted with chestnuts to attain the high level of biodiversity needed to control pests and diseases naturally. Information about other crop trees and how they can be incorporated into a chestnut planting is available from the Northern Nut Growers Association and North American Fruit Explorers (NAFEX), see Appendix.

The first important step in establishing a chestnut planting (once you've decided to do it) is careful planning. This process should start at least 6 months to a year before any work is started. Unless you are already a tree farmer, or at least have a lot of experience and a track record of success in tree planting (two or three trees in your yard doesn't count), you should get help with this step. Your local DNR district forester should be one of the most helpful persons with this process. Besides being able to help you put a tree planting plan down on paper, foresters have a lot of expertise in site selection, site preparation, tree planting, post-planting care and maintenance, ground cover, weed control, and protection from deer/rabbit/mouse damage. Your local NRCS office can be very helpful in evaluating a potential site for suitable soil types. They may also be able to provide some cost sharing for tree planting in some cases. The University of Missouri Center for Agroforestry, www.centerforagroforestry.org, is a good source of information for growing chestnuts in the Midwest. For selection of species, strains, and varieties of chestnut seed, nursery stock, and related supplies, consult the information sources listed in the Appendix. Also in the Appendix is a list of organizations which could be very helpful, and their membership fees could be some of the best investments you ever make.

At a minimum, items to be addressed in your planting plan should include:

- Site selection
- Site preparation
- Between-row ground cover
- Between-row mowing (frequency and height)
- Spacing between and within rows
- Selection of seed or nursery stock
- Planting (trees and ground cover)
- Weed control
- Control of deer, rabbit, gopher, and mouse damage
- Prevention of damage from fire and herbicide drift
- Management of soil pH (in areas with high pH soils)

This plan should be down on paper, referred to frequently, and followed. It should be flexible, and should be amended as necessary. Unanticipated problems will crop up, and will need to be addressed, but not by ignoring or discarding the plan.

Site Selection

Site selection is the first and possibly the most important step in the planning process. You need to decide if chestnuts can be grown in your area, and on your soil. In general, if you live south of a line from about Maquoketa, through Cedar Rapids and Ames, to Council Bluffs, then you are probably within the climate range where pure Chinese chestnuts can be grown (as long as they are from northern, hardy sources). The closer you get to that line, the more marginal they become. North of that line, but east of Interstate 35 (roughly the Northeast quarter of the state), blight resistant hybrids between Chinese and American chestnuts are a viable alternative to the pure Chinese chestnuts. Care should be taken to select strains of hybrids that will produce nuts large enough for the commercial market. The most-cold hardy hybrids can tolerate -50°F.

After climate, the next most important site consideration is soil drainage. Chestnuts require a well-drained soil. They will not tolerate poor drainage. They will tolerate dry, sandy or gravelly soils. If you are not intimately familiar with the soil drainage characteristics of your particular site, you should consult the NRCS or your district forester.

Soil pH is another important consideration for site selection. Chestnuts grow best in a pH range between 5.5 and 6.5. Most soils in Eastern Iowa are within that range naturally. The farther west you go, the higher the pH. West and north of Des Moines the soils are often 7.0 or higher. Calcareous soils in Northeast Iowa often have this problem too. It is not practical to grow chestnuts in a highly calcareous soil. If your soil pH is between 6.5 and 7.5 you can probably amend it using elemental sulfur fertilizer. If your soil is above 8 in pH, it is probably not practical to amend it enough to grow chestnuts, and you should probably grow something else. Avoid frost pockets (low-lying areas) and areas with danger from fire and herbicide drift from adjacent fields, if possible.

In short, the three most important considerations for site selection are: climate, soil drainage, and soil pH. The only one you can change practically is pH.

Site Preparation

Before chestnuts or any other trees are planted, the planting site should be prepared to receive them. If undesirable vegetation exists on the site it should be controlled or eliminated. The worst plants to have on a tree-planting site are smooth brome, orchard grass, tall fescue, and alfalfa (and in that order). If any of these are present the entire area should be completely killed and reseeded to more compatible vegetation. A good seed mix would be bluegrass (20 lbs/ac) and Dutch white clover (2 lbs/ac). A better mix requiring less mowing (once it's established) would be turf-type perennial rye grass (10 lbs/ac), and another 10 lbs/ac of fine-leaved fescue (such as creeping red fescue, Chewing's fescue, or hard fescue, but NOT tall fescue, not even turf-type tall fescue) and Dutch white clover (2 lbs/ac). It is better, but not absolutely necessary, for the ground cover to be established before the first tree is planted.

Selecting Planting Material

As discussed earlier, hardy Chinese chestnuts (or hybrids with Chinese) from northern sources are the only chestnuts that should be considered for commercial planting in Iowa. They should only come from reputable sources, and they should have superior genetics for commercial purposes: hardiness, blight resistance, nut size and quality, and productivity. There are a lot of nurseries out there eager to sell you chestnuts with mediocre or poor quality. Avoid them. Consult the Appendix for good nursery sources. One choice you will have to make is whether to plant seedlings or grafted trees. My recommendation is to plant seedling trees with superior genetics. Grafted trees have multiple, serious problems, and *at best, they perform poorly in Iowa*. Seedling trees with superior genetics will produce nuts just as good (and often better) as the best grafted trees, but they will produce *a lot more of them*. Grafted trees *always* grow with lower vigor than seedlings, so even though they may begin bearing a year or two earlier than seedlings, the seedlings quickly catch up, and then surpass grafted trees in productivity - and that gap just keeps getting wider as time goes on. On average, grafted trees will grow with around 25% or 30% of the vigor of a seedling, and that is just counting the ones that survive! Grafted trees suffer from what it called “delayed graft union failure.” What this means is that the tree may appear to be healthy (but slow-growing) for 5 or 10 or even 15 years, and then die suddenly, for no apparent reason. In Iowa and other northern areas, this may happen to 50% to 70% of grafted trees, depending on the cultivar. And remember, the rest of the trees will be growing with less than 1/3 of the vigor they should have. You cannot do this profitably! Grafted trees are good for one thing, and one thing only: they can produce superior seedlings. So, use grafted trees if you want to breed your own seedlings, but use superior seedlings for nut production.

As of 2016, the chestnut cultivars with a long track record of producing seedlings that grow up into profitable chestnut trees include ‘Qing’ (pronounced “ching”), ‘Gideon’, ‘Peach’, ‘Auburn Super’, and ‘Mossbarger’. There are probably many other good, but unproven parent trees as well. Some chestnuts to avoid include Japanese, European, and Japanese X European hybrids (especially the cultivar ‘Colossal’). The Dunstan hybrids should also be avoided in Iowa. They are marginally hardy in zone 6a and absolutely unsuited to zone 5 and farther north (all of Iowa). Chinese X American chestnut hybrids may be the only option for zone 4b, and are probably the best to plant in zone 5a. Hybrids are more variable than pure Chinese, especially in terms of nut size and blight resistance. It is important to choose sources known to produce nuts of marketable size - 5 grams or larger.

Planting, Spacing, and Thinning

Much is written elsewhere about tree planting, and there is no need to repeat it all here. There are a few points worth emphasizing: Nursery stock should be planted in the field at the same depth it grew in the nursery. Planting too deep is the most common fatal mistake in tree planting. Even 1/2 inch deeper than nursery depth may be fatal to the chestnut seedling. The planting hole should be large enough to accommodate the root system without bending or

crowding the roots. It is better to prune back the roots than to bend or crowd them in the hole. Backfilled soil should be firmed around the roots to eliminate air pockets, but without compacting the soil or mashing the root system.

According to the literature, Chinese chestnuts have a mature height and spread of 40'. It may take 20, 30, or even more years for the trees to reach this size, so if you start out planting at this spacing you will have a lot of empty, unproductive space for a lot of years. A sensible alternative is to start out with a more dense spacing, such as 20'X20'. About the time the trees begin bearing heavily at 10-12 years old they will have nearly filled up the growing space in the planting. Later, as the trees begin to crowd, every other row can be removed. After another 5 or so years, every other remaining tree can be removed, and the "final" 40'X40' spacing will be achieved. Probably another thinning to 80' X 80' will need to happen some 40 to 60 years down the road, and a final thinning to 160' X 160' may be needed in several hundred years.

Post Planting Care and Maintenance

Care and maintenance are very important to the establishment of chestnuts, yet this is where the most failures occur. More than half of all tree plantings done by non-professionals fail. The number one reason for these failures is inadequate (or non-existent) weed control. Very few trees will survive in a planting without good weed control. The worst weeds are grasses, and the worst grasses are brome, orchard, and tall fescue (and in that order). They compete with trees for moisture, nutrients, and most of all for growing space for roots between soil particles. Broadleaf weeds compete with trees mainly for sunlight, and then only when they overtop small trees. Most weeds need to be controlled at least within 3' of trees during establishment. (100' for brome grass!)

Weed control can be accomplished in several ways. One way is to use a combination of high quality landscape fabric (a 3'X3' square for each tree, with the tree growing out a slit in the middle of the square) (Figure 2) together with a topping of coarse wood chip mulch over the fabric. This method is expensive and labor intensive up front, but if properly done and maintained, it needs to be applied only once. The most economical weed control is with herbicides, and the most economical herbicide is **sulfometuron methyl** (Oust). This herbicide should only be applied by professionals with experience applying it on trees. You can hire a consulting forester to do this. Herbicides need to be reapplied every year for 5 years, or until the trees are well established.

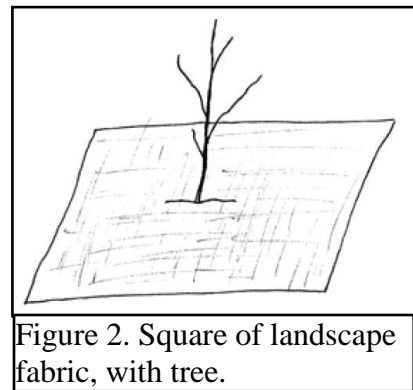


Figure 2. Square of landscape fabric, with tree.

Some people attempt weed control by mulching, alone. This seldom works, and requires so much material (at least 64 pickup loads per acre, to be effective) that it is impractical on any scale larger than a backyard. If done improperly, or with the wrong materials, mulch can cause some severe problems, including total failure.

Another important maintenance task is protecting young trees from animal damage. If there are *any* deer in the area, trees will need a 5' tall, *well ventilated* tree shelter (Figure 3). Plantra, www.plantra.com, makes the best, and the most economical shelters. These shelters protect the trees from rabbits and deer, reduce mortality, increase rate of growth, decrease the number of years before nut-bearing begins, and almost totally eliminates the need from pruning (this is a huge job without tree shelters). Avoid unventilated or inadequately ventilated tree shelters. They will kill chestnut trees. Any time tree shelters are used, it is important to keep the vegetation mowed short between the trees, to keep mice from moving into the shelters and damaging the trees. Even if tree shelters are not used, mowing should be done to control the vegetation between tree rows--but mowing by itself is not enough to provide adequate weed control.

An alternative to tree shelters is the use of deer repellants. There are a number of fairly effective and long lasting brands on the market. Some can even be used in organic applications. All need to be applied 3-6 times per year (for the long-lasting ones). An effective homemade deer repellent spray can be made by mixing one dozen eggs with 5 gallons of water. The mixture must be strained through a window screen, flour sieve, or some other filter, before it is put into the sprayer or the sprayer will plug up. This mixture needs to be reapplied every 2 weeks, year round.

In some areas rabbits will cause severe damage to tree plantings. If rabbits are a potential problem then an inexpensive plastic mesh tree shelter 18" tall should be applied to each tree, if you are not using 5' shelters on them already (Figure 4). The rabbit-resistant mesh shelters cost about 75 cents each. Repellents are not effective against rabbits. See the Appendix for sources of shelters and repellants.

Protection from fire and herbicide drift may be an important consideration in some cases. A good relationship with the neighbor is often the best protection from these hazards. Otherwise a good firebreak at least 20 – 30 feet wide is usually adequate for fire protection. A row of tall, dense shrubs such as Aronia or highbush cranberry can be used as a barrier to block and absorb herbicide vapor drift.

Many insects will feed on the leaves of young chestnuts, but they very seldom are serious enough to need control. Occasionally caterpillars can become numerous enough a treatment with Bt is justified. Japanese beetles may become a serious problem, and will need to be treated with an insecticide. If chestnuts are well planted and cared for on a good site, within 5 or 6 years they will be large enough to hold their own against rabbits, mice, weeds, and insects.

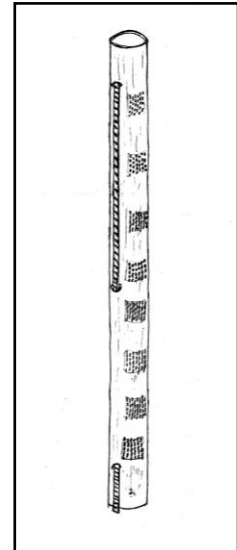


Figure 3. Five foot tall tree shelter with rebar stake.

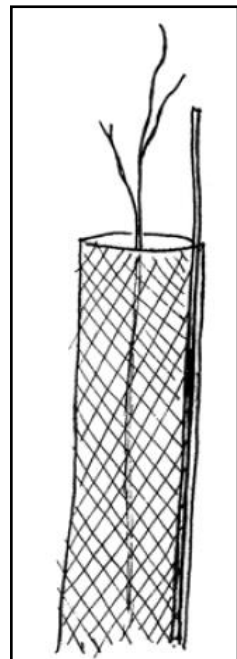


Figure 4. Mesh tree shelter, 18" tall, with stake, provides good protection from rabbits.

Potential Disease and Pest Problems

The fungal disease called Chestnut blight can be a serious threat to chestnut trees. Most Chinese chestnuts are resistant or immune to the blight. A small percentage of Chinese seedlings will be susceptible. No other species of chestnut has as high a level of blight resistance. Phytophthora is another disease that can devastate chestnuts planted on poorly drained soil. There is no treatment. The only practical prevention is to plant chestnuts on well-drained soil. Chestnuts are susceptible to oak wilt disease. It is not known to transmit through root grafts as it does in red oaks. This disease is not considered a serious problem for chestnuts. The best prevention is to avoid pruning, or anything else that will cause sap bleeding from open wounds, between April and July. The sap attracts the beetles that carry the fungus. Several other diseases occasionally damage or kill chestnut trees, but none are considered a serious problem.

Chestnut weevils (two species) are potentially the most serious insect pests for chestnuts in Iowa (Figure 5). *As of this writing, there are no chestnut weevils in Iowa*, though they will probably get here someday. Adult weevils lay eggs in developing nuts. The larvae burrow through the kernel and feed on it. In some areas of Southeastern United States the

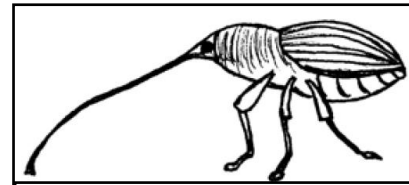


Figure 5. Chestnut Weevil.

infestation rate approaches 100%. Control with insecticides is possible but difficult. One possible way to control it is achieved by allowing chickens to free-range in the orchard, and allow hogs to clean up any nuts missed during harvest. This effectively breaks the weevil's life cycle. The chestnut gall wasp, which was introduced from Asia, causes severe damage to chestnut trees in some areas of the Southeast. The insect is slowly moving north and west, but might never reach Iowa. Gypsy moths will probably spread across Iowa someday. In severe infestations the caterpillars can defoliate whole forests, but trees are seldom killed. The caterpillars can be controlled with Bt.

Once chestnuts begin bearing, the nuts will be very attractive to mice, chipmunks, squirrels, turkeys, raccoons, and deer. Prompt, daily harvesting may be the only way to insure you get your share. A program of population control for the squirrels may also be necessary. In general, chestnut diseases and pest problems are fewer in number, more manageable, and less serious than for most other crops grown in Iowa.

Pruning

Chestnuts are unlike apples, cherries, peaches, and most other tree crops in that they do not need an annual pruning program. If grown without 5' tree shelters, chestnuts need to be pruned to establish a clear trunk up to about 8 feet to facilitate access under the tree for nut harvest (Figure 6). This pruning is done during the initial establishment of the planting, within 5 to 10 years. Try not to prune off more than $\frac{1}{4}$ to $\frac{1}{3}$ of the top in any one year, or the tree may become stunted. Avoid pruning from April through

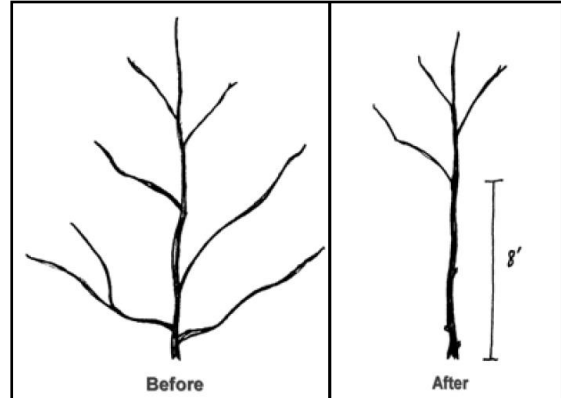


Figure 7. Pruning a chestnut for clear trunk up to 8 feet.

July if possible. Limbs should be pruned when they reach about 1" in diameter. Do not prune limbs flush with the trunk, but instead cut beyond the "branch collar," the swelling at the base of the branch (Figure 7). Once the 8' clear trunk is achieved, the chestnuts need no more pruning. **The use of 5' tree shelters eliminates almost all the need for pruning.**

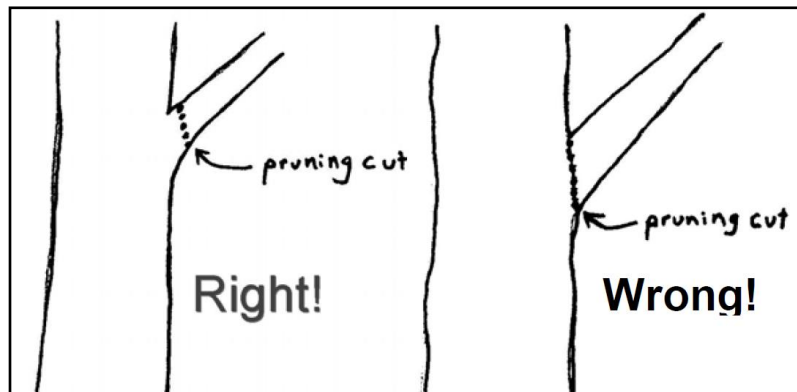


Figure 6. Proper and improper pruning cuts for chestnut limbs.

Mowing

Mowing between tree rows will continue to be important even as the trees mature. The most critical mowing is done in mid to late August, and again just before nut harvest. Trying to harvest chestnuts hidden in tall grass is impractical if not impossible.

Fertilization

Chestnuts can grow and bear profitable crops of nuts without ever being fertilized, but to get the very highest yields a program of regular fertilization will be necessary. Organic fertilizers including finished compost can be used instead of chemicals. Beware of compost made from city yard waste. It often contains substances toxic to trees. If you want to use "city compost" then take a representative sample, place it in a small container, and try growing something like pinto beans in it for a few weeks. If the beans do well the compost is probably all right. If they fail to germinate or die later, then don't use that compost on your trees. Organic fertilizers from commercial sources should be safe. The higher cost can be easily offset by the high value of the crop. If chemical fertilizers are used then regular soil tests should determine the quantity and type. Regardless of what kind of fertilizer is used, it should be applied in spring and never any

later than early June. Fertilizer applied later will result in tender late season growth which will be subject to winter damage. Fertilizer (except for finished compost) should not be applied to trees in the year of their planting, but may be started in the 2nd year. A good fertilization program should maximize the trees' growth rate, health, vigor, nut production, and resistance to disease, insects, cold, and drought.

Management of Soil pH

In areas with a naturally high soil pH such as Western Iowa and limestone-soil areas in Northeast Iowa, successful chestnut growing may require careful management to bring soil pH down at least to 6.5. Elemental sulfur is probably the best choice of fertilizers for acidifying soil. Avoid aluminum sulfate. For soils with a pH above 8, it may be impractical to try to amend the soil, and you should probably just grow something besides chestnuts.

Harvesting, Handling, and Marketing Chestnuts

Most seedling chestnuts with good genetics, if well planted and cared for on a good site, should start bearing when they reach 6'-8' tall (about 3-4 years with tree shelters, or 5-8 years without). You can expect marketable quantities (100 pounds per acre or more) within 5 to 9 years, and a mature level of production (2000 pounds per acre or more) between 12 and 15 years (depending on site, management, and the varieties being grown).

Starting in mid-September, the spiny burs which enclose the chestnuts (and protect them from squirrels) will begin to open up (Figure 8). Most of the nuts from any one tree will fall to the ground over a period of 3 – 5 days. That 3 – 5 day period will be different for every tree, and for a population of trees, may stretch from early September to late October. A few nuts get stuck in the burs and drop with the burs a few days or so after the main nut harvest for that tree. When the nuts are falling, you are racing against the squirrels, and if chestnuts lay on the ground for more than two days, they will dry out and be ruined.

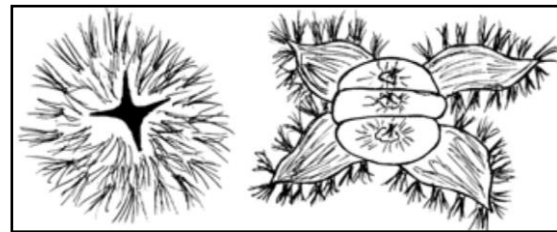


Figure 8. Chestnut burs: opening and fully opened.

Around the world, most chestnuts are harvested from the ground by hand. Mechanized alternatives range from very expensive, motorized, self-propelled machines, all the way down to a wire basket mounted on the end of a stick. We have tried several mechanical harvesters, and watched a few others work. The one we think works the best is "Holt's Nut Wizard" www.holtsnutwizard.net. Don't be fooled by cheap, Chinese made knock-offs. Those do not hold up under usage, and their "lifetime guarantee" is as useless as their machine is after one hour of use!

Post-Harvest Handling

After chestnuts are harvested they need to be separated from any leaves, twigs, burs or rocks, and cleaned of any dirt (hosing them off with water will work for this). If washed with water the nuts will need to be thoroughly drained before bagging. The nuts should be stored in mesh bags or double-bagged in craft paper. Plastic bags can work in a pinch, but the nuts will need to be cooled *before* bagging, and some holes will need to be punched in the bags to let the nuts “breathe.” They need to be kept cool. Refrigeration is recommended, but not absolutely necessary. The most important point is to never let the chestnuts dry out, not even a little bit. Chestnuts can be stored indefinitely at a temperature between 28°F and 30°F. They still need to be kept from drying.

Marketing

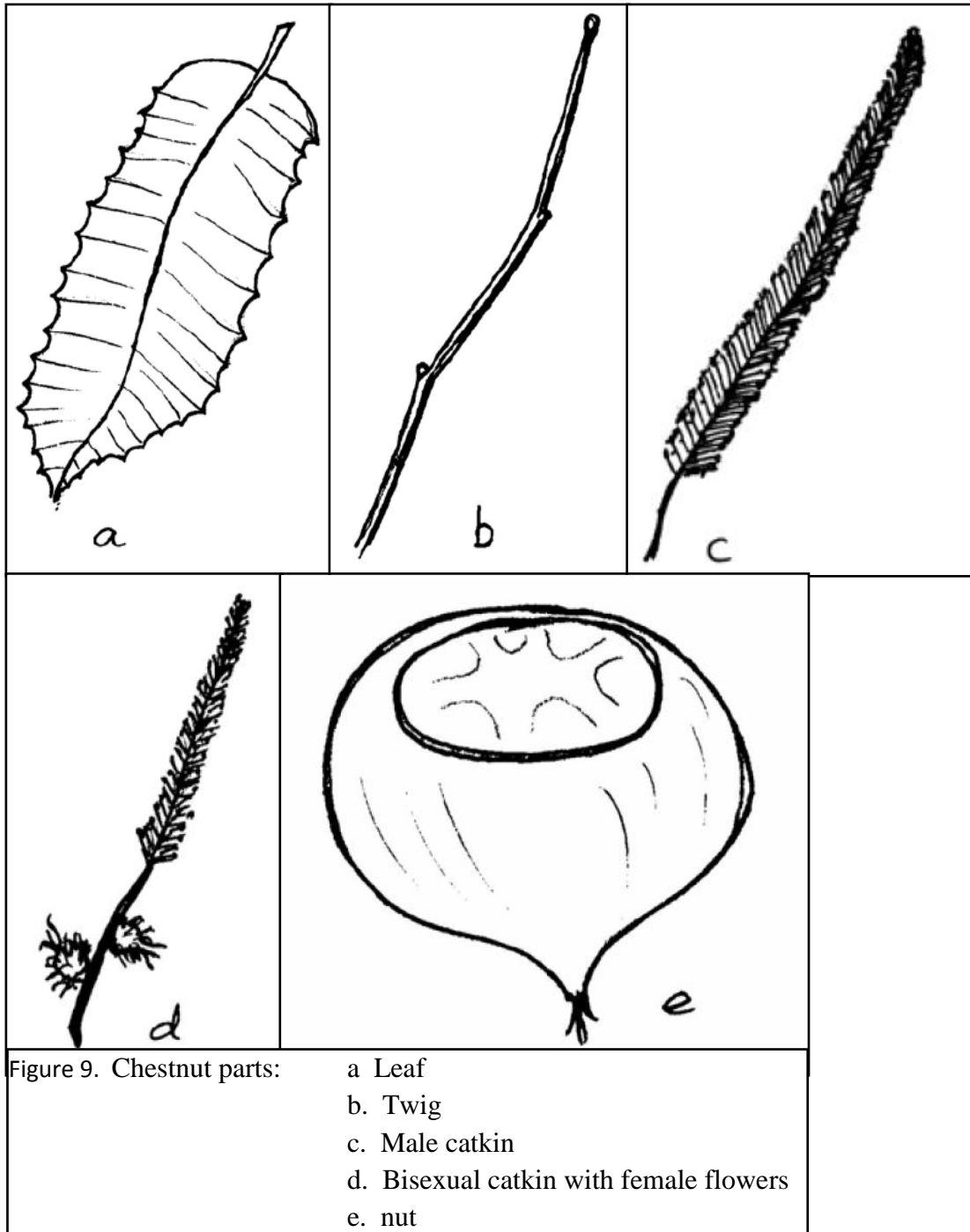
The market for chestnuts is huge and growing. It would take over 20,000 acres of mature chestnuts to produce as much as the US imported in the year 2000. Today we have around 3500 acres of chestnuts in North America, and about 100 new acres are being planted each year. At this rate, it will take 170 years before we have enough acres to meet the demand we had in the year 2000. Meanwhile, demand has been doubling every 10 years at least since 1980. Even with demand this high, chestnuts are not a crop you can just take down to your local elevator - they have to be marketed, somehow. Several options are available. Chestnuts can be sold at farmer’s markets, grocery stores, health food stores, to wholesalers, or through the Internet, by mail order. Each of these outlets has its own set of advantages and challenges. The easiest is to sell directly to the Prairie Grove Chestnut Grower’s Cooperative, located in Columbus Junction, Iowa, and run by Roger Smith (563-260-6333). There is no fee or application process - you only have to bring in quality nuts. Prices paid to growers ranged from \$1.30 per pound for small nuts, up to \$2.70 per pound for the highest priced nuts (medium sized). Probably the most lucrative way to sell is through PYO (“pick-your-own” or “U-pick). The customers come and pick up the nuts every day. This eliminates costs for harvesting, sanitation, sorting, bagging, refrigeration, advertising, marketing, packaging, and shipping. All of those cost savings add up to pure profit, even if the nuts are sold at a slightly lower price.

Conclusion

It is hoped this primer will help you make wise decisions about whether and how to grow chestnuts. If any of this information is unclear or inadequate you may contact Tom Wahl of Red Fern Farm at:

Red Fern Farm
13882 I Ave
Wapello, IA 52653

phone: 319-729-5905
email: tom@redfernfarm.com
Information is also available at www.RedFernFarm.com .



Appendix

Sources of Seed/Nursery Stock

Badgersett Research Corporation, Box 141, Canton, MN 55922. www.badgersett.com. Source of cold-hardy hybrid chestnuts and hazels.

Burnt Ridge Nursery, 432 Burnt Ridge Road, Onalaska, WA 98570. 360-985-2873. <http://landru.myhome.net/burntridge/>. Source of chestnuts and many other crop-bearing trees and shrubs.

Empire Chestnut Company, 3276 Empire Rd. SW, Carrolton, OH 44615. www.empirechestnut.com. Source of high quality Chinese chestnut seed nuts and nursery stock.

England's Orchard and Nursery, 316 S. R. 2004, McKee, KY 40447. 606-965-2228. www.nuttrees.net. Source of a wide selection of fruit trees and some nut trees.

Red Fern Farm, 13882 I Ave, Wapello, IA 52653. 319-729-5905. www.redfernfarm.com. Source of high quality, locally grown nursery stock for chestnuts and a variety of other crop-bearing trees and shrubs. Managed by Tom Wahl, author of this primer.

Sources of Equipment/Supplies

A. M. Leonard, 241 Fox Dr. Piqua, OH 45356-0816. 800-543-8955. www.amleo.com. Source of horticultural tools and equipment.

Central Landscaping, 4026 County Road 74 South, St. Cloud, MN 56301. 800-772-3888. www.centrallandscape.com. Wholesale only (you must be a business) supplier of lawn, garden, and landscape equipment. Low cost source of deer repellants.

Forestry Suppliers Inc., PO Box 8397, 205 West Rankin St., Jackson, MS 39201 800-360-7788. www.forestry-suppliers.com. Retail supplier of a wide variety of tree-related equipment and supplies, including deer repellents, landscape fabrics, and tree shelters.

Books

Tree Crops by J. Russell Smith. Out of print, but available all across Iowa through interlibrary loan.

Permaculture: A Designer's Manual by Bill Mollison. Available from Good Earth Publications, (704) 863-2288, or through inter-library loan.

Nut Tree Culture in North America, Edited by Richard Jaynes, published by the Northern Nut Growers' Association. Out of print, but available through inter-library loan.

Nut Growing Ontario Style by John H. Gordon Jr. Available through inter-library loan.

Organizations

ATTRA, Appropriate Technology Transfer for Rural Areas, PO Box 3657, Fayetteville, AR 72702. www.attra.org. Lots of good, free information. Ask for materials list at 800-3469140.

Chestnut Growers of America \$35 (individual) or \$45 (household) to Jack Kirk, 2300 Bryan Park Ave, Richmond, VA 23228. An international association of growers of chestnuts.

Iowa Nut Growers Association. \$10 per year to Patty Judas, 1212 Bauch St, Waterloo, IA 50701
Good source of information on growing a wide variety of nut trees.

Nebraska Nut Growers' Association. \$20 per year, www.nnga.wildapricot.org. Good source of information, seed nuts, and scionwood for grafting (but not much on chestnuts).

Northern Nut Growers' Association. \$40 (individual) or \$50 (family) per year to Jeanne Romero-Severson, Treasurer, PO Box 489, Notre Dame, IN 46556. www.nutgrowing.org.
Excellent source of information.

Practical Farmers of Iowa. \$20 (student), \$50 (individual), or \$60 (farm or household) per year. A network of progressive farmers interested in sustainable agriculture and involved with a wide variety of cutting-edge practices and enterprises (including chestnut growing). One of the most respected and admired sustainable agriculture groups in the world.

Prairie Grove Chestnut Growers. (563) 260-6333. Cooperative of chestnut growers from Iowa, Illinois, and Missouri.

USDA National Agroforestry Center. www.nac.unl.edu. They publish a number of technical bulletins on incorporating trees into agriculture.