By: Dave Long, UCCE Master Gardener of Lake Tahoe

Asparagus--Asparagus officinalis

The UCCE Master Gardeners of Lake Tahoe recently started a comparative phenology and grow-out trail with citizen gardeners in the Truckee area, looking into the identification of asparagus cultivars suitable for home gardeners in the Tahoe/Truckee area. The Truckee Demonstration Garden organized the event which included hands on planting techniques. Each participant received several cultivars to try. This study is expected to take two or three growing seasons. During this time the gardeners will be reporting on how their crops are progressing and will be provided assistance if problem arise.

If you are looking for a hardy perennial to add to your Truckee/Tahoe edible landscape or want an easy to care for element for your vegetable garden, consider the Asparagus. Asparagus, is a low maintenance (after getting established) plant that can provide a delicious seasonal treat from the garden for 15-25 years! If you do consider adding this interesting plant to your garden, select the site as carefully as you would for a tree, since once established the root crowns will send up edible shoots, or when not harvested, fern like fronds for years. This native to the most of Europe, the Mediterranean and western Asia was once assigned to the lily family, though taxonomic revisionists now have placed asparagus into its own family, the Asparagaceae, which includes the familiar asparagus fern house plant and the lace fern used in the florist trade to add greenery for bouquets (neither are true ferns).

Egypt is where the first records (~ 5000 BC) are found related to asparagus as a food. Domesticated asparagus grown as a crop is reported from Macedonia around 200 BC. The later Romans seemed to have elevated the plant to near mystical levels as a component in the Feast of Epicurus, and as a medical herb helpful for sexual fatigue. Its role as an aphrodisiac pops up throughout the middle ages. It is claimed that asparagus tips were served to Madame Pompadour (1721-1764) under the culinary title "points d'amour." Its appearance in the United States is a bit muddled with reports indicating early English colonists brought the plants over and Thomas Jefferson later growing it at Monticello. The other version being that commercial asparagus growing in the US begins in the middle of the 19th century.

California leads the nation in asparagus production, accounting for nearly 50% of all asparagus grown in the US. Primary growing regions are in the Central Valley, Monterey County, and surprisingly Imperial County. Stockton in San Joaquin County holds an Asparagus festival each spring. China is the world leader in asparagus production by a wide margin. In the Tahoe area, gardeners do grow this fern like plant and there are unconfirmed reports that stands of asparagus gone wild can be found streamside in the Glenbrook area, an escaped relict from Glenbrook House days.

The keys to asparagus cultivation (other than to select a site where the plant can be left alone) are soil and site preparation. Asparagus does best with well drained, even sandy soil that have a very slightly acidic to slightly alkaline pH. A slight salinity in the soil has been reported to improve growth performance. In Tahoe with lots of granite around, along with a coniferous forest, finding slightly acidic soils are not a problem, but forget finding any type salty

soil. Additions of limestone, and bone meal can help with highly acid soils, but is difficult to dramatically alter the pH of soils without industrial amounts of amendments. Purposefully increasing soil salinity is not a recommended practice for Tahoe. Still, asparagus can be successfully grown here in Tahoe as long as the soils are not too acidic. Heavy soils or soils without good drainage can be amended with sand, compost, or well-aged manures. One aspect to asparagus growing that cannot be overlooked relating to site preparation is weed removal and control. Asparagus just does not do well if it has to compete with weeds or other plants, this includes having the asparagus root crown competing with tree roots or being shaded by trees - asparagus likes full sun for as long as possible. When planted in a dispersed gardening situation (dispersed gardening refers to inter-planting of vegetables and plants throughout the area rather than having distinct areas for each variety) the asparagus while surviving does little more than send up one or two shoots per season, not enough to harvest.

Starting from seeds to build an asparagus plot (called a plantation if commercial) can be done, however the much more common process is to use one year crowns. If using seeds you need to start them indoors 6 to 12 weeks before the last frost is expected (first week of June), harden off for about a week and then transplant to the garden. Use a decent sized container for the seeds so you can hold off planting to the garden until well into July or August if desired or necessary, so the plant will not be root bound. Treat seedlings as you would the one year crowns by planting in a shallow trench or depression and backfilling over the course of the summer as the shoot grows. This puts the developing crown deeper into the soil profile where temperatures and moisture are more moderated. The advantage in using seeds for the home garden in Tahoe is two-fold. 1.) The selection of seed cultivars is quite good and for a lot less money you can try a number of varieties; and 2.) You have greater leeway in deciding when to move the seedlings to the garden. With crowns you want them in the ground as soon as received, and there is difficulty in getting crowns shipped after about April 30th, so you sometimes have to hold the crowns for a month or more before getting into the garden. The disadvantages with using seeds is you delay harvesting by at least one year and some of the newer all male hybrid cultivars are not readily available by seed.

One year old root crowns are the more common means of starting an asparagus plot. The crowns have usually been grown in containers or in beds at nurseries specializing in asparagus propagation. They are prepared for shipping by removal from the container, washing soil from the roots drying and packing in damp sawdust, or shredded newsprint prior to shipping. The one year old crowns have been shown to be able to handle the transplanting shock better than older root crowns. Digging up older plants and splitting the crowns, is an option but the plants suffer more from the effort when compared to the one year crowns.

The conventional approach to planting the root crowns is to dig a trench 8-10 inches deep and place an inch or so of manure or fertilizer amended soils in the bottom of the trench. Some accounts recommend using a higher phosphorus content fertilizer to kick start root production. Place the crown into the trench with the roots spread and the stem portion upright. Cover with soil until the trench is half filled. As the plant sprouts start backfilling, so that by late summer you've filled in the trench. This approach assures that the crown is well below ground surface where winter temperature are more moderate. Spacing between plants

should be 12 inches and 36 inches between rows. Some of the purple varieties can be planted closer together.

Recently a more simplified approach to planting crowns has become vogue, which calls for prepared holes 8-10 inches deep and adding amended soil/manure to the hole. Spread out the roots and cover the hole to ground surface, discarding the periodic backfilling step. This methods seems to have caught on commercially as a cost saving approach where winters are milder. The extension programs from Minnesota and Michigan where winter temperatures can reach -30F recommend the conventional season long backfilling method.

Harvesting can begin in the second year if you have used the one year root crowns and the third year if you started with seeds. This first year harvest is little more than a taste of the first shoot from each crown, anything more would impact future plant development. By the fourth year you should be able to harvest each plant a number of times, but you will notice that each stem removed will be slightly thinner than the previous one. Once the stems are one-half to two-thirds the diameter of the first season stalk (or in mature plantings when new shots are reduced to the diameter of a pencil) it is time to stop the harvest and let the plant rest and send up its fern like vegetation. You can cut down the stems to ground level in the fall when they turn yellow and brown, usually after the first hard frosts.

When harvesting, the shoots should be 6-8 inches in length, with leaf bud scales tightly closed. The method of harvesting does have an effect on fresh storage aspects. Carefully cutting the stem below the ground surface (the stem coloration below ground surface will be more white than green) allows the stem to harden over the cut surface which allows less moisture loss and longer fresh storage. And yes there is a specially designed asparagus knife for this type of harvesting. An alternate harvest method is to snap off the stem at ground surface, with subsequent shorter storage. The harvested stems should be kept cool or refrigerated with the cut base in water. True gourmands relish the white asparagus spear which are green spears that have been kept out of the light by burying the growing shoots in light soils or hay mulches. A lot of extra work, but in the market they get premium prices.

There are a number of cultivars for asparagus. Some cultivars are long time heirlooms while others are tissue propagated and are all male hybrids. The old standbys are the Washington series (Martha, Mary, Waltham) developed by the US Department of Agriculture and are open pollenated dioecious (separate male and female) plants. Many of the purple asparagus plants are also similar to these heirloom varieties. These old lines are widely adaptable to differing soil and temperature regimes. The root crowns, when ordered, will contain both male and female plants. The male plants have small yellow flowers and the female plants will develop red asparagus berries (not edible). The male plants are a bit more productive but the female plants will grow stems that have a greater diameter. Rutgers University in New Jersey has led the way in developing the newer types of male hybrid varieties, which are more productive and more disease resistant than the older asparagus cultivars. The male hybrids are more productive because little energy is expended in fruit/seed production. The earlier cultivars had a male to female ratio of 70 to 80% while the more recent cultivars are nearly 100% male. The difference is in use of tissue cultures from hermaphroditic male parent. See Jack Rabin's article in the

reference section for details. The Rutgers varieties include: the Jersey series (Knight, Giant, Supreme and King).

Most recently Guelph University in Ontario Canada has released their series of cold adapted asparagus, primarily Guelph Millennium an all-male hybrid that does have cold and disease resistance in its favor, and should be considered for a Tahoe planting. Expectedly many of the cultivars developed by the University of California (Davis and Riverside) focused more on heat tolerance and heavy soils and are not quite as attractive selections for the Tahoe garden.

Aphids (of course) occasionally can be a problem on maturing fronds, seldom on the harvested shoots. Keep an eye out for ants that manage and protect the aphids. There is an Asparagus Beetle that is bright orange in color having 6 black spots on each wing cover. An interesting insect in that it can reproduce asexually (as can aphids) as well as sexually. Multiple generations can occur during the growing season. The overwintering eggs are laid on the mature fern like fronds. Control can be with insecticides during the growing season and removal and disposal of fronds at the end of the growing season following a couple of hard frosts. Fusarium Crown, Root and Stem Rot is sometimes a problem, if the plants become stressed due to drought. With well-maintained mature stands, the Fusarium fungus while present can be tolerated. If you over water your plot consistently, you may encounter Phyophthora Crown, Root and Stem Rot. Fumigants are used for control of rots at commercial plantations, but for the home gardener the best solution is close monitoring of water applications.

Cultivars being evaluated:

Mary Washington *(seedling and root crown)* is an open pollinated cultivar developed by the United States Department of Agriculture to address asparagus rust susceptibility. Its history is an interesting example of cooperation between commercial and government interests. During the earliest years of the 20th century asparagus rust became a huge problem for growers in parts of Massachusetts every year, affecting the fern-like fronds that develop following harvest. The rust weakens the entire plant affecting the following year's crop. In 1906 the Massachusetts Asparagus Growers obtained the assistance of both the Massachusetts Agricultural Field Station and the Federal Bureau of Plant Industry (A section in the Department of Agriculture). The Department of Agriculture was created by Abraham Lincoln in 1862. The grow trial research led to finding a rust resistant male plant from an unrecorded area of the US, which was crossed with a female plant, the English Reading Giant. The progeny proved to be a fine tasting asparagus, with exceptional rust resistance. Further crosses between sibling plants showed that the resistance, growth and taste characteristics were stable and carried through subsequent generations. By around 1910 Martha Washington (or Washington Asparagus) was borne. Very soon another cross of a Washington male plant with a variety called Mary gave rise to the Mary Washington strain (released in 1919), which had much of the rust resistance plus larger seeds, seedlings and shoots, compared to the Martha Washington. Later on a Waltham strain was developed. By the early 1920s the Washington strains of asparagus (Martha, Mary and Walthum) dominated the markets where rust affected local growing areas.

Jersey Knight *(root crown)* is one of a series of all-male hybrids developed at Rutgers University by Howard Ellison and John Kinelski that is based on crosses using the super-male cultivar Scott Howard as the male parent. The resulting progeny are nearly completely male plants. Jersey Knight was patented in 1989 and introduced shortly thereafter. The Rutgers University asparagus program has for over 70 years, been working with growers, mainly on the east coast to develop improved cultivars for commercial and home gardens. The start of the operation was in response to dire problems New Jersey growers began to have with crown rot (Fusarium) during the 1960's. Ellison and associates in inspecting infected fields found individual plants more resistant to the infections and "discovered" one or more plants that had both male and female flowers (hermaphroditic). From this chance finding and with careful selection the super-male plant called Scott Howard was produced. While Scott Howard could not be reproduced via conventional sexual propagation (nor were the plant's attributes all that good), root crown divisions and tissue cultures allowed for replication. It was the crosses made from this super-male, which includes Jersey Knight that were developed for both pathogen resistance and high production rates.


Jersey Knight photo credit Nourse Farm.

Guelph Millennium *(root crown)* is another all-male hybrid that was developed by Dave Wolyn of the University of Guelph in Ontario Canada. As with the Jersey series, the Guelph is based on use of a super-male parent. Selection of progeny was for cold tolerance and disease resistance. One unintended consequence has been good production rates over a wide range of soil types. Released as the name implies around 2000 it has become the go to cultivar in much of Canada and colder northern portions of the United States.

Purple Passion *(root crown)* while not quite an heirloom like Mary Washington, has been around for some time and is mentioned frequently in articles and reports as a specialty type spear. The plant is dioecious. The origin and history of the current cultivar is not well known. The purple color is quite intense in the spear though dissipates, rather is dispersed as the plant stem grows and the frond branches emerge from the axial bud scales. The color is also lost when heavily cooked or steamed, not unlike many of the purple colored beans. On the other hand this cultivar is reported to have up to 20% more sugars than most green varieties, a slightly nutty taste and good asparagus taste which along with being very tender allows it to be used uncooked or only slightly blanched. One of the parent sources are reported being from Switzerland or northern Italy. It is unknown if crosses made with green varieties retain all, some or any of the purple color. This variety is said by some as being a bit less resistant to Fusarium and Asparagus Rust.


Purple Passion photo credit Nourse Farm.

Did you know: You cannot escape a discussion of asparagus without talking about its effect on the odor of your urine within minutes after it has been eaten. And of course there have been

many scientific investigations to determine the cause, the compounds and why a small percentage of people claim that they do not smell the difference, or cannot smell it. Ben Franklin weighed into this topic trying to get various scientific academies to investigate possible drugs to counteract the effects (he was also looking for a drug to deal with flatulence). This quirk in asparagus consumption has been discussed for centuries, but now there is a pretty complete understanding of the processes. Asparagus contains the organosulfur compound asperagusic acid (only found in plants of the Asparagaceae family), which is rapidly metabolized (as when eating asparagus) and breaks down into compounds that include dimethyl sulfide, dimethyl disulfide, dimethyl sulfoxide and dimethyl sulfone. Asperagusic acid has low volatility but its metabolites are highly volatile organic compounds with volatilization occurring at room temperatures. So with urine temperatures above the volatilization temperatures the odor becomes immediately recognizable. Why some people cannot smell this effect, or claimed not to be able to smell the asparagus effect (my pee does not smell!) was resolved around 2010 when a genetic sequencing firm undertook a study of 10,000 clients, where they asked about urine odors after eating asparagus. The company "discovered" that those who reported having no noticeable change in urine odors had a specific genetic mutation that coded for olfactory receptors, and as a consequence really were unable to smell the sulfur compounds. Now if they could find something for flatulence ole' Ben Franklin would be happy.

I hope you consider planting asparagus as part of your edible landscape.

Asparagus Recipe...
Thomas Jefferson's Asparagus on Toast

Thomas Jefferson's Asparagus on Toast - Certain liberties taken with the original recipe by Leni (the Cook) Sorensen from The Jefferson Monticello

1. Clean 25 short (about 6-8 inches) asparagus spears. As cleaned place the spears in cold water.
2. Bundle together using string or raffia.
3. Cut the bases of the spears so they are of identical length.
4. Place the bundle into boiling water that has been well salted
5. Boil for 20-30 minutes, until the spears are tender and bright in color. Left too long and much of the taste, color and texture will be lost. Remove too quickly and the flavors and textures will not have developed.
6. While the asparagus is cooking, lightly toast slices of a large loaf crusty bread.
7. Very lightly dip toast into the water that was used for boiling the asparagus
8. Place the toast on a plate and pour melted butter onto it.
9. Place several spears onto the toast arranged so that the spears do not hide or overhang the toast edges.
10. Served with an accompaniment of melted butter.

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