



## What Are Grafted Tomatoes?

My body may be in the middle of November as I write this, but my mind has already fast forwarded into May and June. I started looking at this year's (old) catalogs and discovered grafted tomatoes. Costs range from \$8.00 to \$15.00 per plant. Is this high price per plant actually worth it? Maybe.

Grafting is a natural plant propagation method. There is no exotic scientific process involved, nor is there the use of genetically modified organisms (GMO's). Grafting has been used for thousands of years to improve fruit tree and grape harvests. In tomato grafting, the top part of one plant is attached to the roots of a second plant. As the two different tissues fuse, a new plant is

formed.

The upper portion of the grafted tomato is called a scion. In the United States, an heirloom tomato variety is commonly chosen as the top portion, but any tomato variety may be used. Heirloom tomatoes are noted for their delicious flavors and fruit quality, but the plants tend to be very sensitive to environmental stress and (especially) soil-borne diseases. Heirlooms may grow for a while, but then start turning yellow as they become infected with fusarium fungi, verticillium wilt, or root knot nematodes. If rotating the planting area of your tomatoes each year is impossible you could grow your tomatoes in containers of disease-free commercial potting soil. Or you could try replacing the infected garden soil with disease free soil, try sterilizing your soil, or spraying with pesticides. All these options are either impractical, expensive, time consuming, or environmentally unfriendly. You could overcome these problems by using grafted tomatoes.

The bottom portion of the grafted tomato is called the root stock and is chosen for its disease resistance and vigor. The vigorous roots absorb water and nutrients very effectively. The root stock is usually a specially selected hybrid tomato that has a wide variety of resistances to bacterial, fungal, viral, and nematode diseases. It may also be tolerant of environmental extremes of temperature, excess water, or drought. By using a disease resistant rootstock the farmer or home gardener is able to raise a healthier plant with more production, extended length of harvest, and less disease. Growing grafted tomatoes is environmentally friendly, because the gardener uses less pesticides and ends up with an increased yield.

The most commonly used root stock variety is 'Maxifort'. The plant is a monster. Its root system is five to ten times larger than that of other tomatoes. It will not fit in a small size container garden. The superstructure can grow to over 25 feet tall. Unfortunately, the fruit are very small and are described as having the flavor of motor oil. This variety is useful only as root stock. It is resistant to several root-borne diseases, and protects the grafted scion from disease. However, the scion portion is still susceptible to early and late blight, as well as other leaf diseases that are carried by wind and rain.

The whole process of grafting tomatoes requires special care. The cost of the rootstock seeds are expensive, 50 seeds for \$22.95. If the seedlings grow at different rates, root stock and scion seeds may need to be planted at different times. Both root stock and scion growth should be timed so both have a diameter about half that of a pencil at the time of grafting. Sterile equipment and techniques are needed to prevent infection of the graft union. Special plastic clips (about 10 cents each) are used to secure the graft until it heals. The grafted scions need to be protected from drying out, and are

placed in specially constructed, darkened, cooled humidity chambers for about a week. Then, the plants are gradually exposed to more light and grown on until transplanting to the field.

When you receive your grafted plants, they do require a little extra babying. When planting, plant high and do not bury the graft union. You do not want the scion portion to set roots (which are susceptible to soil-borne diseases) and defeat the whole purpose of grafting. The graft union itself should be well healed, but rough handling may break or injure the graft. It is recommended that the tomato be supported to keep the scion portion elevated. Since the plant will tend to be vigorous and grow larger than other tomatoes, I recommend the use of cages made from 5 foot high concrete reinforcing wire. The extra vigor of the roots may also encourage root stock suckers that could overwhelm the scion; prune these off. Some gardeners recommend extra pruning of vigorous and excess leafy growth above the graft.

Grafted tomatoes may be hard to come by locally. Because customers balk at paying such a high price for one plant, sales are poor, and nursery centers often stop offering grafted tomatoes. Mail order companies such as Territorial Seeds, Burpee, White Flower Farms, and others carry these plants.

Grafted vegetable plants are widely used in Japan, Korea, Spain, and Greece, and are beginning to be used by organic farmers in the United States. Japanese and Korean farmers, due to their intense cultivation of land over centuries and due to the build-up of diseases in their soils, now grow over 95% of their tomatoes as grafted plants. In the United States, reports of 20 to 40% increases in production over non-grafted plants have been reported. Much of this increase is due to larger fruit rather than an increase in number of fruit, as well as to an extended season with healthy plants. In western North Carolina, using grafted plants overcame a serious bacterial wilt problem. At the end of the season, 90% of non-grafted plants were dead; 100% of the grafted plants were alive and ended up yielding over two times the amount of the surviving non-grafted plants. In a different side by side comparison, one Master Gardener describes his results:

“Our grafted tomatoes were more robust than any tomato we had ever grown. They fruited earlier, more plentifully, bigger and much longer. When we removed our trial plants from their beds on Oct 17, 2011, every ungrafted tomato was completely dead and each grafted plant was at least twice as big as its ungrafted counterpart had ever been and they were bright green and loaded with fruit!”

<http://gardenrant.com/2013/06/grafted-tomatoes-a-million-of-them.html>

However, some gardeners on garden blog sites reported little or no improvement in tomato production, and would not grow the expensive grafted tomatoes again. Universities are generally positive about using grafted tomatoes, especially where soil-borne diseases are a problem. Because of the exceptional vigor of the root stocks, larger crops are reported even if disease is not a problem.

Will I try growing grafted tomatoes? Yes, but on a very small scale. I want to grow a grafted ‘Brandywine’ side by side with a non-grafted ‘Brandywine’. But since I am married to my financial manager, I have to get her OK first.

Happy Gardening,

Joe Baltrukonis