

## **Tips from Ten Years of Grafting Tomatoes**

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Many greenhouse growers started grafting tomatoes because they were running into production problems, which were mainly the result of repeatedly growing tomatoes in the same greenhouses year after year. The issues were many and varied between growers but “corky root rot”, “high salinity” and other issues were driving down our production and, equally as bad, the above ground problems seemed to be increasing and hastening the demise of the tomato plants productive months. The first generation of root stocks had good disease resistance but lacked in their level of vigor to continue to push production. The next generation, e.g., “Maxiforte”, which we use today has both good disease resistance but also an extraordinary level of vigor.

Anyone who has watched a good house painter will observe that it is the hours/days of prepping the houses surface that makes the paint job go easy and turn out well. Similarly, grafting tomatoes is all about preparation of the plants weeks before hand and their care immediately after grafting. The actual “act” of doing the graft is rather perfunctory and the skill level needed only average. The slogan; “the devil is in the details” is very much true when it comes to grafting tomatoes. The following is a list of do’s and don’t we aspire to. I have very good fellow tomato grafters who do things much differently than us and they get great results; it is truly more art than science. But as one veteran grafter once admitted; the details that work in January may not deliver the same results in April. Light intensity, greenhouse temperature and humidity levels are much different and your lists of parameters will change. The following is a check list of points to keep in mind and adjust as your season progresses.

We start with fresh seed for our earliest seedings. It is January 14th and there is no room for error. By February 14th, I am more lenient about using old seed and I am more tolerant of skips because our production by then is so high. The first seedlings we plant are our bottom tomatoes or root stock (Maxiforte). It is a wild hybrid tomato from Thailand and consistently has always had some delayed soil emergence issues. Two days later we plant our tops or scions on the tomato you want to produce. (Sixty percent of our tomato production uses Geronimo.) If we are doing a 98 tray of Maxiforte we will plant a quarter of a 98 tray the Geronimos and another quarter tray everyday thereafter till it is full. Since we are “top grafters” (as opposed to side grafters) it is very important, come the day to graft, that all our rootstock and scions match width-wise. Since we are doing hundreds of grafts at a time, this process of staggered seedings works well for having the right sized plants when you need them. For this reason we over plant by 15% just to be sure we have an ample amount of sizes to make our quotas.

**Point #1:** Stagger Plantings to get good sizes choices

**Point #2:** Do not over nourish your plants; a bit purple-ish and light green is good.

We use Vermont Compost Co. “Forte lite” as our soil. We never feed the plants anything but water and rely on the innate fertility inherent in the soil mix to see them through the entire grafting process. We also use Root Shield and other plant/seed protectants.

**Point #3:** Provide bottom heat (never over 73 degrees) and a bit of artificial light.

Bottom heat is essential but double check you mats for hot spots etc... too much heat can be worse than slightly cool (lower than 70 degrees). Over heating is dangerous because it starts a stretching tendency in the plant that is hard to arrest. This year we finally built a boiler which gives us very even heat. We also box in our heat tables to take night time drafts out of the equation. We built mini-greenhouses out of five or so 1/2" electrical conduit bent over the table and some cheap clear plastic. Make sure you have mini roll-up sides so you don't overheat during daylight hours.

**Point #4:** Use larger top graft clips and larger (thicker) plants. Remember, if one has to be fatter than the other "always" have the top scion bigger than the bottom root stock.

Though you can buy 1.2 and 1.5 grafting clips, we only use 2.0 and up... There are many reasons but "1.2mm clips = too small = too young".

**Point #5:** Do not cut too much of an angle; the Japanese cut them completely flat. So use your judgment. We try for a 45 degree angle.

**Point #6:** Choose your plants the day before grafting and place them in a two lane tray. From now on bottom water only. The day before grafting, we choose the root stock tomatoes and place them in a 98 cell tray that has been cut so that it has two long lanes of cells. This holds the plants upright and stable during grafting and also (most important) allows us to work down the line of plants without disturbing the previously grafted plants. From now on no more top watering. Only bottom watering. We have found keeping the stems and leaves free of any liquids keeps impurities out of the equation. Oxidate your bottom watering tray liquid and keep it at 400:1. This water "must" be kept germ-free and pure.

**Point #7:** Immediately after grafting put the special cut 98 cell strip into a solid 10X20 tray and put a "high dome" over it that has been misted on the inside to create ample humidity. Place the domed tray and plants in the ACU or darkened heated area. You want a stable 78 degrees and about 95% humidity. Most important of all is an extremely low light level. This can't be emphasized enough; it must be close to 85% reduction. Keep your mister at the ready all day and once more late at night. It is important to mist the "inside" of the dome and "not" the plants. Be sure the temp doesn't spike. Again, too much heat will only stress the plants healing process. Our source of "high domes" is Growers Solution: 2212 Isaacs Pl.; Cookeville, TN 38506 Tel: 931-528-3398

**Point #8:** Do most of your grafting after 2PM especially on sunny days. It is less stressful to the plants. You will get better and quicker takes if you wait till afternoon. There must be some scientific plant physiologically reason; suffice it to say, it works for us.

**Point #9:** Be attentive to moisture, heat and light for the next three days. The scion may droop a little but just be patient. If just before grafting, you see that the scions plants have oversized leaves or too many leaves, it's advisable to remove some or even cut the leaves in half. "Be careful" there is a fine line between lessening the leaf load on the plant but then again having enough leaves that it creates a need in the plant to suck up nutrients from the rootstock and urge the tissues to reconnect and heal.

**Point #10:** After 3-5 days move the grafted plants into “recovery area #2”. It should still have shady \ diminished light and we also keep the domes on but now start slightly opening them. As the days go by evaluate your grafts and slowly acclimate them to your greenhouse environment. Be very aware of a sudden change in the sunlight during these last days of readjustment. If you pull your plants out of the first recovery room at the beginning of three days of clouds and rain, be very cautious about the effect the sunlight will have when it finally returns. I have seen beautiful healthy plants roll over and die from too sudden a change in light or acclimation to the dry hot air of a greenhouse on a sunny day in March.

**Point #11:** Leave the clips on till they pop off on their own.

**Point #12:** Purchase Mike Collins’ video showing his techniques. Mike knows more than anyone I know about this delicate process. It is available from UVM video/DVD store.

**Point #13:** Keep sanitation awareness and execution upper-most on your list. We use Oxidate and other disinfectants at all stages of our operation. Use new 98 cell trays. New 2.0mm clips. We sanitize our razor blade we graft with after every ten cuts. As mentioned earlier if you respect the details needed, the devil will have a hard time thwarting your best efforts.