

How We Propagate Some Difficult-to-Root Plants[®]

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I am going to mainly discuss *Rhus typhina* 'Bailtiger' Tiger Eyes[™] staghorn sumac (PPAF) and *R. aromatica* 'Gro-low'.

***Rhus aromatica* 'Gro-low'**. This is what we have found to work on 'Gro-low'. We take as juvenile cuttings as we can and that means taking cutting from plants from our fields that were planted out the same spring as we take the cuttings. So what we are doing is just taking a cutting from a plant that was rooted the year before. We take these cuttings as soon as they are big enough to cut off which is usually late July or early August. Once the cuttings are taken they are put in cold storage usually 2–5 h after they are cut. The cuttings are kept in cold storage for as short a time as possible before sticking, but we have had them in cold storage for up to 5 days before sticking, which we don't like to do. The cuttings are stuck in a greenhouse with sand used as the medium. An overhead application of 1500 ppm Rhizopon water soluble IBA is used as the rooting hormone. The cuttings are kept under mist until rooted. During the rooting process we try to get the cuttings dry going into the night after 3 or 4 days. After about 2 weeks the misting cycle is cut back somewhat. Cuttings start showing roots after about 2 to 3 weeks and are fully rooted and off mist after 50–60 days. They are put on a fertilizer schedule at this time. These cuttings are cut back once or twice while they are in the propagation beds. The cuttings are dug around late November through December. Harvested rooted cuttings are stored in a cooler which is set at around 35 °F with humidity set around 90%. Rooted cuttings are kept in the cooler until they are graded. The cuttings root at about 75%–85% but only about 70% make our grade for our use and sales. The cuttings are then roll wrapped in plastic and peat or stored in large plastic bags that fit our pallets with some damp peat on the roots. These cuttings are then stored in a freezer at about 27–28 °F until planted in the spring.

***Rhus typhina* 'Bailtiger' Tiger Eyes[™] staghorn sumac.** Tiger Eyes[™] staghorn sumac is another plant that can give us trouble in propagation. We have two methods for propagating this plant, one is from dormant root pieces and the other is from softwood cuttings produced from root pieces.

Here is our procedure with dormant root cuttings. Plants in our bare-root fields which provide the roots are dug either in fall or early spring. These plants are from 1- and 2-year-old field-grown plants. When the plants are dug in the fall which is usually mid October or early to mid November they are placed in our cold storage facility maintained at about 35–40 °F. We try to store the Tiger Eyes[™] staghorn staghorn sumac plants in a dry part of the cooler because we have had problems in areas with higher humidity. As the plants are being graded root pieces are cut off for use in propagation. Once these roots are cut off they are stored in plastic bags and put in a freezer maintained around 27–28 °F. We have had problems on and off with storing these root pieces dug in the fall, sometimes they were stored a little too damp and the roots rotted. We also had a problem one year when the plants went dormant early in the fall but resumed growth when the temperature warmed up again. That caused us all sorts of problems, not only storing the root pieces but also the plants themselves.



Figure 1. Making root cuttings.



Figure 2. Two bundles of the root cuttings.

We pull the frozen root pieces out in March and prepare them for planting. We allow the roots to thaw for a day or so before cutting the root pieces into 2- to 2½-in. lengths. I would say the ⅛- to ⅜-in. diameter pieces work the best for us, but we plant most everything from around ⅙- to ¼-in. diameter root pieces. A lot of our diameter size depends upon how desperate we are for the root pieces. We have tried 1-in. long root pieces, but our rooting percents were much lower. After preparing the root pieces we place them in cold storage at around 34–36 °F.

We also use roots from spring-dug plants and that is the direction we are headed because we have very few problems with the roots rotting in storage. The roots that are dug in the spring just go straight into the cooler, they are not frozen and they are only in the cooler about a month. These root cuttings are prepared the same as the root cuttings from the fall-dug plants.

We start sticking the root cuttings as soon as we can in the spring which is usually late March to early April in sand beds in a greenhouse. We have found that a rooting hormone has not really helped in the rooting process for us. We use a dibble board to make the sticking holes. The root pieces are inserted about ⅛ to ¼ in. below the surface of the sand and then covered with sand. The spacing between cuttings is 2 ½ in. × 2 ½ in. We will heat the greenhouse in the early spring if the temperature gets in the 40–45 °F range. We otherwise let them warm up naturally by the sun to around 75–80 °F during the day. Depending on temperature, the root cuttings will start breaking bud and push through the sand after 7 to 10 days. We will usually start seeing roots after about 2 weeks, again depending on temperature. During the rooting process we let the top ⅛ in. or so of sand become dry before watering. We don't want the sand too wet or too dry during the rooting process. After about 60 days the cuttings are rooted and growing well. These cuttings are put on a regular fertilizer schedule. They are grown on and used as a softwood cutting source during the summer. The plants are left in the greenhouse until they are dug in the late fall or early winter. We get anywhere from 30%–60% rooting with about 35%–45% of the cuttings usable. They are put in cold storage at about 34 °F and processed as soon as possible. After processing they are placed in a freezer at about 28 °F until they are shipped to our fields or sold in the spring.

We also root Tiger Eyes™ staghorn sumac by softwood cuttings. We have tried rooting cuttings taken from our bare-root fields and containers and have had very poor success at doing this. I would say our rooting percentages from these two sources ranged from 0%–20% at best. What we have found to work best for us is taking softwood cuttings from the root cuttings that are growing in the greenhouse that I described above. I think juvenility is one of the key factors in rooting these cuttings. We take the cuttings when they are large enough to cut. We like to have at least two sets of leaves on the cuttings when we take them. We store the cuttings in a cooler after taking the cutting. We then prepare the cuttings as soon as we can usually the same day or the day after. We do not like to let these cuttings sit in the cooler very long. When preparing the cuttings we remove the terminal bud and trim the leaves to about half their normal size. We think we would have just too many problems during the rooting process with the large cuttings. This is one of the few taxa that we do any bench work on. Most other cuttings are prepared right in the field. The cuttings are stuck in a greenhouse in sand as soon as possible after preparation. Cuttings are stuck on 4 in. × 4 in. spacing. After sticking the cuttings are treated with an overhead application of 1500 ppm Rhizopon water soluble IBA



Figure 3. Shoots coming up in the greenhouse.



Figure 4. A finished plant from root piece with roots and shoot.

as a rooting hormone. They are kept under mist until rooted which is right around 25–30 days. We have had rooting percentages run from around 10% to 90% with an average of around 70% or so on these softwoods. Some of our biggest problems with rooting softwood cuttings of Tiger Eyes™ staghorn sumac have come from keeping them too wet, using cuttings that are too soft or hard, and other reasons unknown. After rooting, cuttings are put on a fertilizer schedule and cut back as needed. They are dug in early to late December, put in cold storage, and graded as soon as possible. After they are graded and processed they are put in a freezer and stored at about 28 °F until they are either planted in our bare-root fields or containers or sold.

I would like to say these are the only two plants that we have had problems with but that is not the case. At some time or another we have made some very easy-to-root plants difficult; not that we were trying to do this we just made it happen one way or another. I wish I could pinpoint exactly the reason why we might have had some poor stands; sometimes the reason is obvious and sometimes not, but that is part of the job that can keep it interesting and fun.