Propagating Dumbcane

(\textit{Dieffenbachia spp.})

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Dumbcane, or \textit{Diffenbachia spp.}, hails from Brazil. It is a common indoor plant that found its beginning indoors during the Victorian period (1800’s) like many other inside plants (Klingaman, 2002). In propagation, the \textit{Dieffenbachia} species are similarly treated, so it is often listed (like in the Plant Propagation textbook) as \textit{Dieffenbachia spp}. Some of the commonly used species are \textit{amoena, maculata, picta}, and \textit{seguine}. Out of these, \textit{amoena} is the most common. Some popular cultivars are ‘Tropic Snow,’ ‘Honey Dew,’ and ‘Camille.’ The most prominent difference between species comes from the variegation in the leaves. Another difference can come in plant height.

Dumbcane is grown for its showy foliage. Its most identifiable feature is the finger-like variegation that comes off of the leaf midrib. Its stem is cane-like and its inflorescence of flowers is contained in a green spathe. The leaves can grow 6 inches long and the plant can grow to 6 feet tall.

\begin{figure}[h]
  \centering
  \includegraphics[width=0.5\textwidth]{diffenbachia.png}
  \caption{Picture of \textit{Diffenbachia amoena} showing its oblong variegated leaves (Cornell, 2008).}
\end{figure}

One thing to remember when handling this plant extensively (especially during propagation) is to wear gloves and avoid any skin contact with the sap. Dumbcane can be toxic if ingested and has a tendency to irritate the skin—especially the tender skin around the nose or eyes. If ingested it can cause temporary paralysis of the vocal cords (which is where it gets its name). Its additional symptoms are just as unpleasant.

To begin propagation of this plant, you can get propagules from a wholesale stock nursery or a facility that specializes in plant reproduction. There are a few ways that \textit{Dieffenbachia} is propagated: cuttings,
layering, and tissue culture. They can also be propagated by seed, but this method is only used in breeding (Chen, 2003).

**Propagation by Cuttings**

The types of cuttings used to propagate *Dieffenbachia* are tip and cane. These cuttings are herbaceous, which means they can be taken any time during the year (Hartmann, 2011). Generally the conditions used for these cuttings are as follows:

- **Mist**—Root quality is increased when under misted conditions (e.g. mist chamber, mist bench, or mist tent) (More, n.d.).

- **Rooting hormones**—a concentration of 0.1% IBA is beneficial and results in earlier and better root growth. For cane cuttings, use the soaking method for 4 hours (after which thoroughly wash) and for tip cuttings, use the quick dip method for 15 seconds (More, n.d.). An alternative method is applying IBA by spraying on tip cuttings (Hartmann, 2011).

- **Media**—the media that the cuttings can be propagated in are sand or a similar well-drained medium. Because of the long period required for rooting, a media that is not well-drained can lead to root rot (especially in mist conditions). One source suggested a specific mixture of 50% peat, 25% bark, and 25% perlite (Chen, 2003). Another interesting alternative was rice husk (Alieu, 2011). A temperature of 70 to 75 degrees F should be maintained for optimum rooting (Chen, 2003). Dumbcane also benefits from bottom heat.

- **Transplanting**—In 3 to 8 weeks (depending on the roots), the cuttings can be transplanted into 6, 8, or 10 inch pots—depending on the size of the intended plant (Chen, 2003).

When taking a cutting of *Dieffenbachia*, it is best to take a cutting of at least three nodes. More shoots and roots form off of a three node cutting than a two node cutting (Ayodele, 2011).

![Fig. 2. Picture demonstrating tip (A) and cane (B) cuttings (Lindgren, 2008).](image)

**I. Tip Cuttings**

Take a cutting 3 to 5 inches long of at least 3 nodes (*Figure 2.A*). Treat with rooting hormone, via quick dip or spray, and stick
upright in well-drained medium. Place under mist.

II. Cane Cuttings
Cut a portion of the cane 2 to 3 inches long of at least 3 nodes. Treat with rooting hormone via soaking method. Next place the cutting on its side just below the surface of the medium about half of the stem diameter (Figure 2.B.). Place under mist.

Propagation by Layering
The layering method used for Dumbcane is air layering. This method is best applied to plants that are tall and “leggy,” meaning that they only have foliage at the top of a long stem.

Start by selecting an area that is a node or two below the desired plant length. Make sure that there are no leaves above this point for 3 inches.

Girdle the stem at the chosen point. There are a couple of ways you can do this: girdle by removing a 1 cm band of bark; or by making a slanting upwards, or downwards, cut (Lindgren, 2008). If a slanting cut is chosen make it 1 to 1.5 inches long and a quarter to halfway through the stem. Then, to hold open the cut, insert a toothpick (as shown in Figure 3.A.) to prevent it from healing. To increase the rooting of both girdling methods, dust the wound with rooting hormone.

Next encircle the wound with moist sphagnum peat moss or rock wool (Figure 3.B.). Then, wrap plastic around the moss and secure both ends with twist ties—making sure no moss is protruding (if the moss isn’t completely covered it will dry out more quickly) (Figure 4.A.). Next, cover the plastic with aluminum foil to keep roots dark and to prevent too much heat buildup. Make sure the media is kept moist (a syringe works well to remoisten).

When a suitable root system has formed
(like in Figure 4.B.) cut just below the root ball. Lastly, pot it up in a clean soil mixture. As for the rest of the plant, cut it back to a stub (about 3 inches above the soil line) so that new growth can form at the base.

**Propagation by Tissue Culture**

Propagation by tissue culture is most often used to create disease-free stock plants. One method to reduce the containments on a *Dieffenbachia* chosen for tissue culture is to keep the plant cool and dry (without being watered) for 3 weeks (Hartmann, 2011). The breakdown for tissue culture is as follows:

- **Propagules used**—leaf and petiole.
- **Media**—basal medium containing MS (Murashige and Skoog). Make sure the medium pH is adjusted to 5.8 (Shen, 2007).
- **Growing conditions, timing, and plant growth regulators**—cultures should be kept dark for 8 to 12 weeks. They should then be moved to a 16 h light photoperiod (which can be created by cool white fluorescent lamps) for 4 weeks. Next, they should be cut into pieces (a weight of about 150 mg) and put in a shoot induction medium (of 40 ml) under 16 h light photoperiod for 8 weeks (Shen, 2007).
- **Transplanting**—remove individual plants of 20 mm length (with 2 to 3 leaves) from “callus clumps” and plant in 60 cell tray. Use a media of 2:1:1 of Canadian peat, vermiculite, and perlite (Shen, 2007).
- **Acclimation**—plantlets should be shaded in the greenhouse. They should now be under a natural photoperiod of 10 to 14.5 h light with temperatures ranging between 68 degrees F and 88 degrees F. Water twice a week. Acclimation should last about two weeks (Shen, 2007).

**Conclusion**

The most cost effective way to propagate Dumbcane, *Dieffenbachia spp.*, on a large scale is cane cuttings. It is straightforward and makes use of plant material in an efficient way. Because of its upright growing habit (and therefore lack of tips), tip cuttings are just not practical. As for air layering, it can’t be justified unless it is a beloved indoor plant because it simply takes too long to be of use on a larger scale.

Tissue culture is not as useful in producing cost-effective liners, but it has its place in creating healthy stock plants. When it comes to producing disease-free plants, it can’t be beat.
Literature Cited


