

Nuggets of knowledge[©]

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Moderator: What percentage of production costs is electricity in a tissue culture laboratory?

Dharam Sharma: Ours is about 10% in central California. Costs depend on the type of lighting and air conditioning system.

Gayle Suttle: Our cost is about 3.5% in Oregon. HVAC is a major user of electricity.

Steve McCulloch: Generally, electricity can be less than 5% of your costs, depending on how efficient your systems are. Many labs are now looking at LED lighting. That is going to have a profound effect on our electrical bills. A lot of the electricity goes toward lighting, air conditioning, and autoclaving.

Sam Huang: Electricity is 3 to 5% of costs at our laboratory in Oregon. When we moved our lab from California to Oregon, we were able to take advantage of cooler weather to reduce our electrical costs.

Moderator: If someone finds a new plant, what is the procedure followed by a tissue culture lab to get the plant initiated?

Steve McCulloch: The first thing we do is have a conversation with the customer. Often, we will get an email inquiry, but we have found that it is best to sit down in person or talk over the phone to thoroughly understand what the customer's goals are with the plant, so we can best help them. After that, laboratory procedures are fairly straightforward. We also need to have a good familiarity with the plant because there can be some inherent and important things about the plant. The plant may have disease problems or there may be viral problems present in the stock. So, the process starts with a conversation and involves our doing some background work to understand the horticulture and the propagation difficulties with that plant.

Moderator: What is the cost to get a plant into tissue culture?

Gayle Suttle: Unfortunately, that is the first question most people ask us, along with "How quickly can we get the plants?" The time involved may be one year, it may be five years, or may be never. We always begin with the end in mind. What is the customer's goal? Based upon our experience, we must decide whether the project makes sense and whether the customer's company is likely to be in business one, five, or ten years in the future. At our company, we have exclusive and non-exclusive contracts. For an exclusive plant, there is a cost involved that is direct to that customer. If we start a non-exclusive plant, we can sell the plant to anyone else, and we do not charge for that. We must evaluate the opportunity for success. We know there are certain plants that we are never going to be successful with (as with plants that have a slow multiplication rate). In all cases, we charge the culture initiation fee, which is just a partial cost of getting a plant into culture, and then we figure out what it is going to cost us. We base our prices on how many hood hours it takes us to produce the plants. We have a very simple financial model that relates the cost of everything in our company to the number of dollars per hood hour, and everything ties to that.

Dharam Sharma: The greater the quantity being ordered and the easier the plant is to micropropagate, the lower the price will be. The harder the plant is to propagate and the lower the number needed, the more expensive the plant can be.

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Moderator: What are the hormone rates used for cannabis cuttings?

Melanie Miller-Gonzalez: Many growers will use Wood's Rooting Compound at a softwood rate, whereas others will use a powdered hormone. As with other crops, the choice is grower-specific. In my experience, every grower has a preference in what rate they like to use. I am not aware of different rates being used for different cultivars.

Katy Cunningham: Cuttings will often root without a hormone, but we do use one at Dark Heart Nursery.

Gene Blythe: During our tour of Aroma Cannabis, they were using Clonex Rooting Compound, which is the only EPA-registered product that is available as a gel. This product contains 3000 ppm IBA. Of course, you can take any of the liquid rooting solutions and make them into a gel yourself using a gelling agent.

Moderator: Is there a list of the different rooting hormones that are available for use by nurseries?

Gene Blythe: Yes, just a few years ago Cheryl Boyer, Jason Griffin, Brenda Morales, and I put together a leaflet listing all root-promoting products registered for commercial use in the USA, along with the pros and cons of different methods of application and instructions for preparing gel formulations of liquid auxin solutions. The leaflet is available online as a free download at: www.ksre.ksu.edu/bookstore/pubs/MF3105.pdf.

Moderator: At some of the nurseries we have visited on our tours, a lot of the propagation is done on ground beds or on cement pads. Are the nurseries worried about *Phytophthora* as the trees are placed on the propagation beds?

Jason Julian: Before setting down new plants, we remove all plant debris and wash down the beds. Then we do a preventative Phisan application between crops. We also use new or pasteurized containers (cans, flats, and pots) and follow a set of best management practices for all *Phytophthora*-susceptible crops.

Sam Huang: At Monrovia's central California location, propagation and production of camellias is done in a separate part of the nursery to prevent *Phytophthora* contamination. Also, our technical services department is continually testing recycled water during the year, as well as testing SOD-susceptible hosts twice each year, for presence of *Phytophthora*. Chlorine is injected into the irrigation water as a preventative treatment.

Moderator: Is there a good time card system for tracking hours, and specifically hours spent doing propagation, watering, planting, etc.?

Gayle Suttle: We are moving to a digital timeclock system. The system we think is going to work for us to use for job costing is called T Sheets.