The activities encompassed by this section of the laboratory are meant to be done in parallel with the rooting of mums. The main purpose of this work is to expose the student to the subtle (and often not so subtle) differences in the characteristics and handling of cuttings done for propagation of potted plants.

Whenever vegetative propagation by cuttings is necessary, the following considerations must be kept in mind:

1. Disease control
   a. Use pathogen-free stock plants
   b. Use pasteurized media
   c. Keep a proper air/moisture balance to enhance rooting and prevent development of pathogens such as Pythium.
   d. Meticulous sanitation is crucial. This often means obtaining cuttings by breaking or snapping from the stock plant rather than using knives.
   e. Proper bench spacing must be used. The cuttings must not be packed too closely together.

2. Promoting rapid rooting
   a. Stock plants must be grown in a proper environment and with adequate nutrition
   b. Direct rooting in containers for sale rather than requiring re-potting.
   c. Rooting hormones may be beneficial (but not always)
   d. Temperature must be maintained between 60 - 75 F.
   e. Moisture and aeration: mist propagation can be a disaster if infected stocks are used because of the ideal environment for spread of disease. Use caution and carefully monitor the propagules.
   f. Light. Some plants, like geraniums, prefer maximum light for good development, but this preference must be balanced with excessive transpiration that would ensue during rooting.

3. Type of cutting
   a. Terminal shoots
   b. Leaf buds

The objective for this activity is to compare rooting between mums and *Pelargonium* by assessing:
   1. time to root development
   2. uniformity of response
   3. influence of cutting type and hormones on rooting

You will work in pairs as part of your larger lab team.

1. Obtain plants of 2 cultivars of *P. x domesticum* (or *P. peltatum*) as indicated by the instructor. Record the cultivar names.

2. Remove all flowers/flower buds and any leaves that appear diseased or have evidence of insects.
3. The geranium cutting types used in the industry are:
   a. Shoot tip cuttings of ca. 1-2 to 4-5 inches in length.
   b. Leaf bud or single-eye cuttings (also called 'dormant eye' cuttings).

"Such cuttings consist of a stem section long enough to anchor the cutting in the
propagating medium (usually about 1 inch or 2.5 cm), an attached leaf and its
axillary bud. These cuttings form adventitious roots on the lower main stem
segment, while the axillary bud breaks into growth and forms the shoot"
[MNRogers, Geraniums IV, p 97]

Attempt to obtain as many of the two types of cuttings as possible. Aim
for about 30 cuttings of shoot tips and 20 leaf buds from each cultivar. If you can
produce more cuttings, you'll be able to evaluate other parameters that affect
rooting in addition to those listed in #4 below. Consider placing some cuttings
under a plastic polytent or shade cloth as well as in the mist house.

4. Separate the cuttings into groups of 10 replicates:
   1. Use as a 'control' ; these will be placed on rooting medium without
      further treatment.
   2. Apply IBA rooting hormone to one third of the cuttings [powder form,
      Hormodin®-1]
   3. Remove leaves from one third of the shoot tip cuttings

Create a table similar to the ones used for examining factors that influence rooting
of mum cuttings and collect data that will permit you to compare the response of
mums with that of Pelargonium. What type of data do you suppose you would
need in order to make valid comparisons?

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Data Collection
To be done in lab within 2-3 weeks.

Report
(due one week after final data collection)