Stem propagation of goldfish plants

Video summary

Objectives:

→ Demonstrate the steps involved in the vegetative propagation of goldfish plants (*Nematanthus* spp.) using herbaceous stem cuttings.

→ Test the influence of cutting length, stem section and IBA rooting powder on the rooting success and cutting survival.

Goldfish plants

The genus *Nematanthus*, previously named *Hypocyrta*, belongs to the family Gesneriaceae which also includes African violets and Gloxinias. *Nematanthus* consists of perennial, epiphytic plant species pollinated by hummingbirds and growing exclusively in southeastern Brazil. Plants in the family Gesneriaceae can easily be propagated from herbaceous stem cuttings.

Herbaceous stem cuttings

They can be made both from shoot tips and mid-sections, and are from actively growing material, from the current or previous season. They should not display flower buds or flowers yet. Cuttings usually range from 7.5 to 15 cm, and stems are cut about half a centimeter below the bottom node. Before planting, leaves from the lower third or half of the stem are removed to prevent rotting. Bottom heat or auxins accelerate rooting of stem cuttings.
Growing environment

**Medium**
Gesneriad cuttings require a permanently moist yet light, well-drained and porous potting mixture. Preferably, cuttings should be transferred, respecting polarity, to a 50% peat, 50% vermiculite or perlite potting mixture with a small amount of dolomitic limestone. This type of mixture has a near-neutral pH and retains moisture yet does not become waterlogged.

**Moisture**
All stem cuttings should be maintained in a high-humidity environment to limit water loss by transpiration. With the root system being absent in recently made stem cuttings, a high transpiration rate can rapidly be lethal since water will not be replenished at the same rate. This can be prevented by adding a plastic bag or tray cover above them, by misting cuttings daily, or by using a mist frame or fog chamber.

**Light**
Gesneriads have optimal growth under partial shade, for example under a shade cloth or tree canopy

---

**Experiment design**
The five treatments were arranged in a randomized complete block design (RCBD) with two replications, and each treatment consisted of ten cuttings, for a total of 100 cuttings.

**Experiment 1 – Effects of the cutting length**

→ **Treatment 1**: 3-node terminal cuttings; no rooting hormone.

→ **Treatment 2**: 5-node terminal cuttings; no rooting hormone.
→ **Treatment 3**: 7-node terminal cuttings no rooting hormone.

**Experiment 2 – Effects of the stem section**

→ **Treatment 4**: 5-node mid-section cuttings; no rooting hormone.

**Experiment 3 – Effects IBA rooting powder (Stimroot #1)**

→ **Treatment 5**: 5-node terminal cuttings; IBA.

---

**Results**

→ A greater number of cuttings treated with IBA rooted, and these also have had a greater root score (treatment 5). Good rooting performance was also seen from mid-section cuttings (treatment 4) and by 7-node terminal cuttings (treatment 3).

→ This means that IBA improves rooting success, and root length and density, and that mid-section cuttings are as good as terminal cuttings.

---

**Number rooted**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rooted</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

**Root score**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
3-node terminal cuttings (treatment 1) had a lower survival than other treatments, and this was because they rotted, possibly due to their smaller size.

There was a trend observed where cuttings in the first and last rows of the flat, regardless of the treatment, had a greater root score. This could be because the higher plant density in the middle of the tray caused competition thus reduced root length and density.
Acknowledgements

→ Thank-you to Raina Fan for her video making tutorial and support throughout the project.
→ Thank-you to Danielle Donnelly for her professional recommendations and constant encouragement.
→ Thank-you to greenhouse management who provided me with essential material and workspace.

References


