

HORT 201
Plant Propagation
Laboratory Exercise 3
Coniferous Hardwood Cuttings

Reference: Text pp. 348-350

Objectives:

1. Learn how to make and handle coniferous cuttings and observe root initiation.
2. Compare the difference between talc and quick-dip solutions for auxin application.
3. Compare the effects of various media for rooting.
4. Compare several species with respect to ease of rooting.

Introduction:

Many conifers are propagated by hardwood cuttings taken from dormant, current season's growth. Cultivars of yew (*Taxus*), arborvitae (*Thuja*), falsecypress (*Xanthocyparis*) and juniper (both shrub and groundcover forms) are commonly propagated this way. The average cutting consists of a 6-inch shoot, which has had branches and leaves removed from the basal 2 inches. Some propagators use small tip cuttings, especially when stock material is in short supply.

Because leaves (needles) are present, measures must be taken to prevent desiccation during root formation. Some commercial operations use mist or fog systems for protection on warm, sunny days. Most cuttings, however, are rooted during winter in plastic houses tight enough to maintain high relative humidity to prevent foliage desiccation. Air temperatures are maintained cool enough to inhibit top growth, while bottom heat is often used to encourage root initiation. Without bottom heat, rooting may be slow; this, in turn, may result in late spring planting and inferior growth during the first season. Inclusion of older wood, as in the heel or mallet type of cutting, use of auxin, and basal wounding have been shown to be advantageous in many cases.

Procedure:

Part A: Effect of Auxin Formulation

1. Each group should obtain enough plant material to make 10 tip cuttings of each of the following:

Thuja occidentalis – Eastern arborvitae, American arborvitae

Juniperus chinensis 'Pfitzeriana' – Pfitzer juniper

Xanthocyparis nootkatensis – Nootka falsecypress, Alaska falsecypress

Taxus cuspidata – Japanese spreading yew

Make tip cuttings, 6 inches long, removing all foliage from the lower 2 inches. Wound by drawing a razor blade wounding tool down the lower inch on two sides of the stem, but avoid splitting the stem.

2. Bundle the cuttings into groups of 5. You should have 2 bundles of each species, 8 bundles in all. Label the bundles.
3. a) Treat one bundle of each species with a quick dip in a liquid preparation of K⁺IBA (8000 ppm) for 5 seconds.

b) Treat one bundle of each species by dipping in a talc preparation, Rhizopon AA #2 (active ingredient is 3000 ppm IBA). Tap excess powder from the base of the cuttings.
4. Stick the cuttings 2 inches deep in the rooting trays of peat:perlite (1:1) provided in the same manner as done with the deciduous cuttings on the previous week with 10 cuttings per row. Use the tamping sticks provided for straight rows and to firm the media around the cuttings after you have stuck each row. Label treatments before each 5 cuttings. Labels should include: date, species, hormone treatment, your lab section, and a name identifying your lab group.

Part B: Effect of Rooting Media

1. Prepare 10 cuttings of each of the following, using the procedure outlined above. Bundle the cuttings into groups of 5 and label. Treat all cuttings with a talc dip of Rhizopon AA #2

Taxus cuspidata – Japanese spreading yew

Juniperus chinensis ‘Pfitzeriana’ – Pfitzer juniper

2. Plant 5 cuttings of each species in propagation trays with the following rooting media:

sand

vermiculite / perlite (1:1)

Part C: Evergreen Groundcovers

1. Prepare 10 cuttings of each of the following, using the procedure outlined above. Bundle the cuttings into groups of 5 and label. Treat one bundle of each species with a Rhizopon AA #2 (3000 ppm IBA) talc dip and leave the other untreated.

Vinca minor (Creeping Myrtle, Periwinkle)

Pachysandra terminalis (Japanese spurge)

2. Stick the cuttings in two rows of the rooting flats of peat:perlite (1:1) provided with 10 cuttings of each species per row. Label with treatment, date, lab. #, etc.

All flats from parts A, B, and C, need to be placed in Zone 16 bench 2 on heating mats. Cuttings will be treated with intermittent mist and bottom heat (70°F.).

Results of Exercise # 3 - Scoring will be done at Lab 9 on March 20th

Coniferous Hardwood Cuttings

Lab Section: _____ Group color: _____ Date: _____

You can tell when rooting begins by feeling resistance when very gently tugging on cuttings in about 6 - 8 weeks. When terminating experiments (near end of semester) stick your hand or a trowel underneath the cuttings and push them up to minimize root breakage. Always keep the roots covered with wet paper towels, as they desiccate very rapidly.

Evaluate rooting by the scoring system outlined below:

Score	Observed rooting
0	no roots or callus
1	callus but no roots
2	one or two roots
3	a few roots (3 to 5)
4	moderate root mass (5 to 10)
5	heavy root mass (10+)

Results: Evaluate each cutting and assign a score, based on the rating system provided above. Then calculate an average score for the 5 cuttings in each treatment, and enter those means in the table below. Provide one copy of this sheet per group to your lab instructor.

Part A: Effect of Auxin Formulation

8000 ppm K⁺IBA
in solution

3000 ppm IBA
in talc

Thuja occidentalis

Juniperus chinensis

Xanthocyparis nootkatensis

Taxus cuspidata

Part B: Effect of Rooting Media

	S	V/P	SP/P*
<i>Taxus cuspidata</i>			
<i>Juniperus chinensis</i>			

What do the roots look like? (shape, thickness, branching, etc.). Compare cuttings in one media to those in the other 2 media. A sketch might also help.

S -

V/P -

SP/P -

P = perlite

V = vermiculite

S = sand

SP= sphagnum peat

* this data will come from part A

Part C: Rooting hormones and ground covers

	3000 ppm IBA in talc	Untreated
<i>Vinca minor</i>		
<i>Pachysandra terminalis</i>		