Propagation of Difficult to Root Semi-hardwood and Hardwood Evergreen Cuttings

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Introduction:

Rooting medium plays a vital role in rooting of cuttings, and it has three basic functions (i) to support or hold the cutting in place, (ii) to supply water during the rooting and subsequent growth of the roots, and (iii) to supply oxygen to the cut end of the of the cutting. Several different types of media can be used for the propagation of cuttings (e.g. organic or inorganic mineral based). However, an ideal medium is one which holds cuttings upright and maintains a proper balance of air and water ratio i.e., drain well enough to provide free aeration and yet retains enough moisture to keep cuttings turgid. Furthermore, an ideal medium should be sterile, inert, and homogenous to ensure clean start and uniform rooting.

The cuttings of *Daphne tangutica*, *Chamaecyparis obtusa* 'Templehof', and *Chamaecyparis pisifera* 'Mops' have a reputation for being difficult to root. *Daphne tangutica* is a semi-hardwood evergreen shrub with fragrant spring flowers and attractive glossy foliage. The blooms last from early spring to mid-summer with an occasional rebloom thereafter. Daphne prefers a temperate climate with a well-drained soil. *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops' are hardwood evergreen cuttings. *Chamaecyparis obtusa* 'Templehof' are commonly called as Hinoki Falsecypress. Slender pyramidal habit with whorled, flattened sprays of dark green foliage and slightly drooping branch tips. This plant enjoys full sun and moist soil in a cooler climate. *Chamaecyparis pisifera* 'Mops' are commonly called as Mops false cypress or Golden Mop chamaecyparis. 'Mops' colors best when placed in full sun.

In 2008, propagation trials were conducted with *Daphne tangutica*, *Chamaecyparis obtusa* 'Templehof', and *Chamaecyparis pisifera* 'Mops' in peat/perlite based conventional medium and Oasis® phenolic grower foam medium.

Objective:

Explore the possibility of rooting difficult to root semi-hardwood and hardwood evergreen cuttings in Oasis® phenolic grower foam medium.

Materials and Methods:

Plant Material and propagation of cuttings: *Daphne tangutica* cuttings were harvested on 4/15/08 and stuck on 4/16/08. The cutting were treated with Hormex 3 rooting hormone before inserting into the rooting media. *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops' cuttings were harvested on 1/23/09 and stuck on 1/28/09. The cuttings were treated with Hormodin 3 rooting hormone before inserting into the rooting media. ***Rooting media:*** The cuttings were propagated in a traditional mix (control medium) and Oasis® phenolic grower foam. **Control medium:** In the case of *Daphne tangutica*, cuttings were rooted in 40% perlite + 30% aged bark + 30% peat moss. In the case of *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops' cuttings were propagated in 50% perlite + 50% sand. **Oasis® phenolic grower foam:** Oasis® foam growing medium is made from a thermoset phenolic resin and it is an open celled foam. ***Irrigation:*** The cuttings were propagated under a boom irrigation system and irrigated as required. ***Rooting Evaluation and observations:*** Rooting evaluation on *Daphne tangutica* cuttings was done on 6/05/08 and *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops' cuttings was done on 5/15/09. The percentage of rooted cuttings was recorded and photographs were taken. ***Trial Location:*** The trial with *Daphne tangutica* cuttings was conducted at Spring Meadow Nursery, Grand Haven, MI and the trial with *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops' was conducted at Willoway Nursery, Huron, OH.

Results:

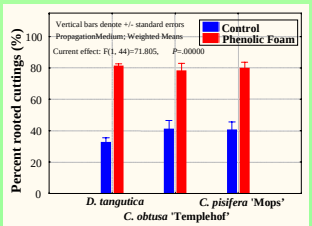


Figure 1. Effect of two different types of rooting media, (A) control medium and (B) Oasis® phenolic grower foam medium, on the rooting of semi-hardwood, *Daphne tangutica*, and hardwood, *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops', evergreen cuttings. In the case of *Daphne* the control medium was (40% perlite + 30% aged bark + 30% peat moss) and in the case of *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops', the control was (50% perlite + 50% sand).

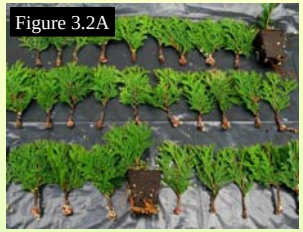
***Daphne tangutica*:**

Figure 2.1. Effect of two different types of rooting media, (A) control medium (40% perlite + 30% aged bark + 30% peat moss) and (B) Oasis® phenolic grower foam medium, on the rooting performance of *Daphne tangutica* cuttings. The trials were conducted at Spring Meadow Nursery during spring of 2008. Cuttings were treated with Hormex 3 rooting hormone and immediately inserted into the rooting medium. Cutting were propagated under a boom irrigation system. The cuttings were stuck on 4/16/08 and rooting evaluation was done on 6/05/08. Photos were taken at the time of rooting evaluation.

Figure 2.2. Daphne cuttings rooted in Oasis® phenolic grower foam medium. In foam, 81% of the cuttings rooted whereas in control medium only 33% of the cuttings were rooted.

***Chamaecyparis obtusa* 'Templehof':**

Figure 3.1. Effect of two different types of rooting media, (A) control medium (50% perlite + 50% sand) and (B) Oasis® phenolic grower foam medium, on the rooting of *Chamaecyparis obtusa* 'Templehof' cuttings. The trials were conducted at Willoway Nursery during winter of 2008. Cuttings were harvested on 1/23/09 and stuck on 1/28/09. Cuttings were treated with Hormodin 3 before inserting into the rooting medium and propagated under a boom irrigation system. Rooting evaluation was done on 5/15/09 and photos were taken at the time of evaluation.



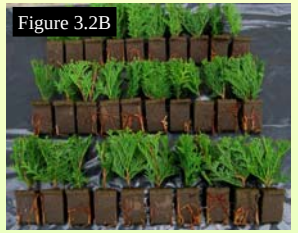


Figure 3.2. *Chamaecyparis obtusa* 'Templehof' cuttings rooted in (A) control medium and (B) Oasis® phenolic grower foam medium. In foam, approximately 80% of the cuttings rooted whereas in control medium only 20% of the cuttings were rooted and majority remained at the callus stage.

***Chamaecyparis pisifera* 'Mops':**

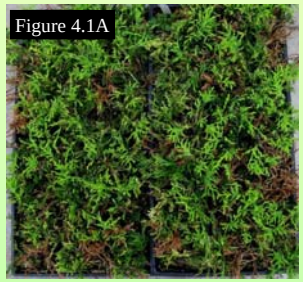


Figure 4.1. Effect of two different types of rooting media, (A) control medium (50% perlite + 50% sand) and (B) Oasis® phenolic grower foam medium, on the rooting of *Chamaecyparis pisifera* 'Mops' cuttings. The trials were conducted at Willoway Nursery during winter of 2008. Cuttings were harvested on 1/23/09 and stuck on 1/28/09. Cuttings were treated with Hormodin 3 before inserting into the rooting medium and propagated under a boom irrigation system. Rooting evaluation was done on 5/15/09 and photos were taken at the time of evaluation.

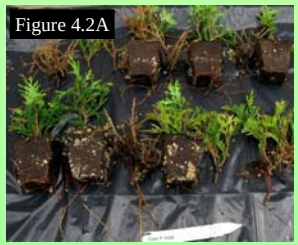


Figure 4.2. *Chamaecyparis pisifera* 'Mops' cuttings rooted in (A) control medium and (B) Oasis® phenolic grower foam medium. Approximately 85% of the cuttings rooted in foam whereas in control medium only 50% of the cuttings were rooted.

Discussion & Conclusions:

This study explored the possibility of improving the rooting performance of difficult to root semi-hardwood, *Daphne tangutica*, and hardwood, *Chamaecyparis obtusa* 'Templehof' and *Chamaecyparis pisifera* 'Mops', evergreen cuttings in Oasis® phenolic grower foam medium. The results indicate that all the three genera performed significantly better in phenolic foam growing medium compared to the conventional medium (40% perlite + 30% aged bark + 30% peat moss or 50%perlite + 50% sand). The improved performance in Oasis® foam growing medium can be attributed to its air and water ratio. Oasis® foam growing medium which is open celled, is engineered for optimal balance of air and water. It is forgiving to excess watering. The current study opens up a new avenue for successful propagation of several of the semi-hardwood and hardwood evergreen cuttings which doesn't like wet feet.

Acknowledgements:

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