

Notes on growing Abies in greenhouse

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The following notes were prepared in response to a request by Dr. R.E. Balch, Forest Biology Laboratory, Fredericton, N.B., who wished to maintain continuous growth of Abies spp. in connection with studies on Adelges. The notes are being circularized at the suggestion of Dr. Nordin.

My recent attempts to grow species of Abies in the greenhouse suggest the following conclusions.

Continuous or long daily illumination increases the rate and duration of active growth in Abies. However, unlike spruce and tamarack, Abies spp. ultimately become partially dormant regardless of the photoperiod. The elongation of the main axis becomes inhibited although growth of branches is not fully inhibited. At least in most individuals the normal growth can be resumed only after a chilling treatment.

This means that to provide normal fresh growth all the time, at least two sets of plants are needed. One set is kept in the greenhouse for about 2 or 3 months, while the other one is at 40°F., and vice versa. Perhaps some overlapping in time in the greenhouse is needed.

I would also suggest the following additional measures if convenient.

1. Use southern seed, and whenever possible from maritime climate. Such ecotypes grow fastest, have the longest growth period, and probably need least chilling.
2. Use large containers for sufficient root space.
3. Add to the soil some (1/3 by volume) peat, or still better, (Sphagnum) moss, and fertilize the soil with plenty of nitrogen once a month. Avoid water containing salts.
4. During mid-winter give the plants as much light as possible. Long day effect can be achieved by short periods of light during the night, but during mid-winter it is advisable to use continuous illumination. Avoid intercepting sunlight with the lamps. If fluorescent light is given, use flat light banks, tilted and placed at the north side of the benches to avoid shading. Arrange the benches so that the southern benches are low and the northern ones high to avoid shading. The greenhouses of course should be on well exposed sites and in the east-west direction. If you use a north-south directed greenhouse, keep the plants in the most southerly compartment in mid-winter.

Fluorescent lamps give a more even light, but combining these with incandescent lamps gives the best quality of light. If the amount of light is high enough (ca. 500 ft-c. continuously), the quality is of no practical importance.

5. Try pruning off the tip of the plant soon after it becomes dormant.
6. Species of Abies can stand very low humidity except during the first weeks after being transplanted from forests (or from otherwise more humid conditions).

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