

## EFFECTS OF VARIOUS GROWING MEDIA ON CONTAINER-GROWN YELLOW BIRCH.

The largest seedlings were grown in pure Jiffy Mix-Plus

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The containerized growing of tree seedlings in northern climates is rapidly becoming an accepted method of producing suitable planting stock (1). Most of the research conducted thus far on containerized growing has been with softwood species; however, there is increased emphasis being placed on high quality hardwoods (2). The University of Maine in cooperation with landowners in Maine and New Brunswick has become interested in growing several high-quality hardwood species including yellow birch (*Betula alleghaniensis* Britton). In anticipation of establishing future progeny tests and seed orchards of genetically superior trees from containerized grown stock, we first had to determine which growing medium provided optimum seedling development (3). The purpose of this experiment was to give us some early indication of which growing medium was best.

### Materials and Methods

A total of five growing media commercially available in our area were used: (1) Promix BX; (2) peat and vermiculite (4:1); (3) peat and perlite (4:1); Jiffy-Mix-Plus; Jiffy Mix-Plus and sand (1:1). A randomized complete block design was used with 50 containers per growing medium per replication and five replications; thus, there were a total of 250

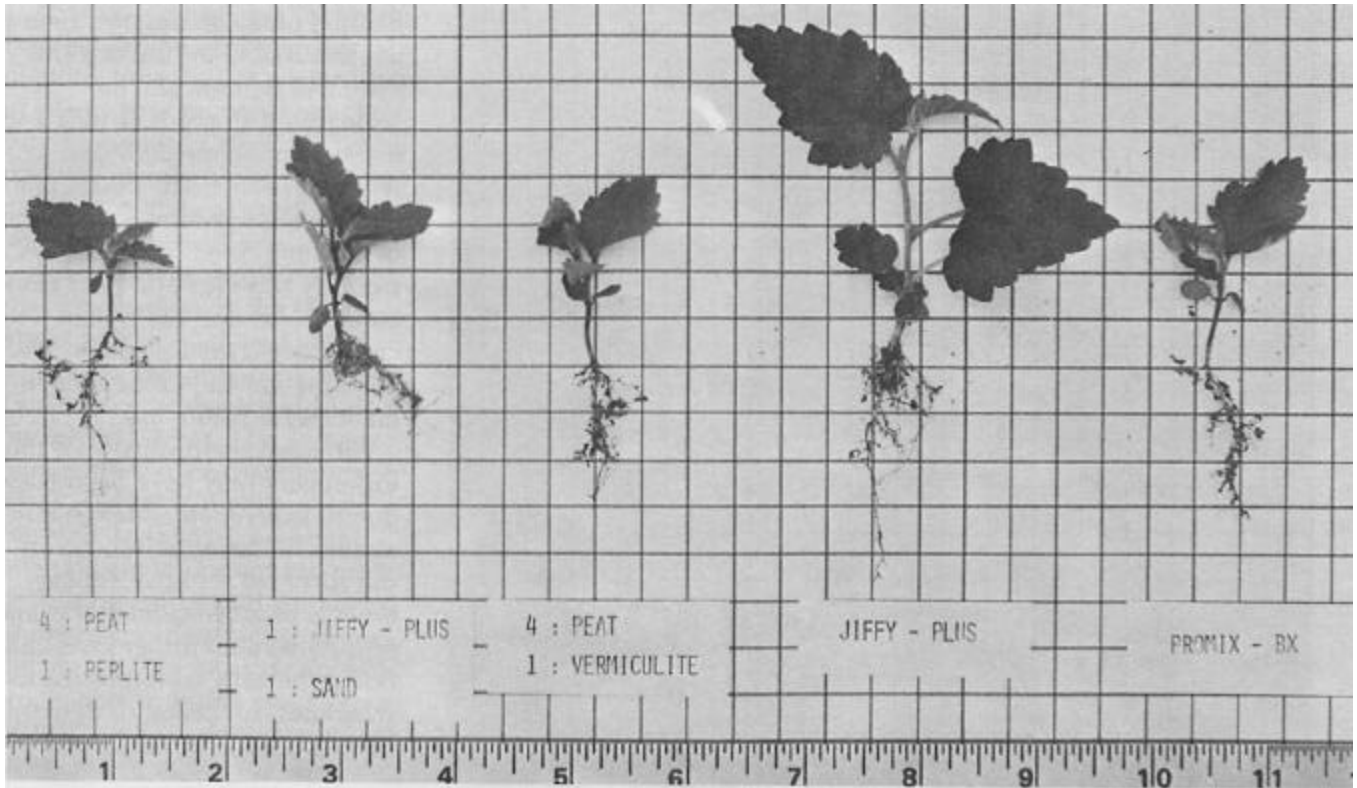
seedlings per growing medium. The seed was an open-pollinated collection from several trees growing on the University of Maine's Dwight B. Demeritt Forest located near Orono. Unstratified seed was sown on April 9, 1975 in Zeiset plant bands (polyethylene coated bleached cardboard 2 inches x 2 inches x 11 inches). Several seeds were initially sown in each container. Extra seedlings were later removed to leave only one per container. Greenhouse temperature was maintained between 68° and 72° F for the duration of the experiment. Seedlings were watered as deemed necessary by the greenhouse technician. There was no supplementary light provided. Seedlings were fertilized on May 6 (14 days after germination) with 4 teaspoons of Start-N-Grow (16-32-16), May 20 (28 days after germination), and June 3 (42 days after germination) with 4 teaspoons of Rapid Grow (5-10-5). Both fertilizers used are water soluble and were applied through an injector system. Height of each seedling was measured on June 26 (65 days after germination) to the nearest millimeter. The data was subjected to analysis of variance and Duncan's Multiple Range Test was used to test for differences between means.

### Results and Discussion

Germination was uniform and rapid. All containers had at least one seedling growing in them within 12 days. After the seedlings had been thinned to leave one per container, there was 100 percent survival of the remaining seedlings.

The differences in growth rate between the various media became apparent after approximately 5 weeks (figure 1) and was quite pronounced after 65 days. The largest seedlings were grown in pure Jiffy Mix-Plus. They averaged almost 35 centimeters and were significantly (.01 level) taller than those grown in all other mediums (table 1). Seedlings grown in the jiffy Mix-Plus and sand medium (1:1) were also significantly (.01 level) taller than those in the other three media. There was no difference shown between seedlings grown in the other media.

The Jiffy Mix-Plus growing medium is a combination of regular Jiffy Mix and Magamp fertilizer blended in a ratio of 10 pounds of Magamp per cubic yard of jiffy Mix. Magamp is a 7-40-6 slow release fertilizer. Evidently at the level of fertilization used, this initial inclusion of fertilizers in the planting medium was responsible for the observed differences.

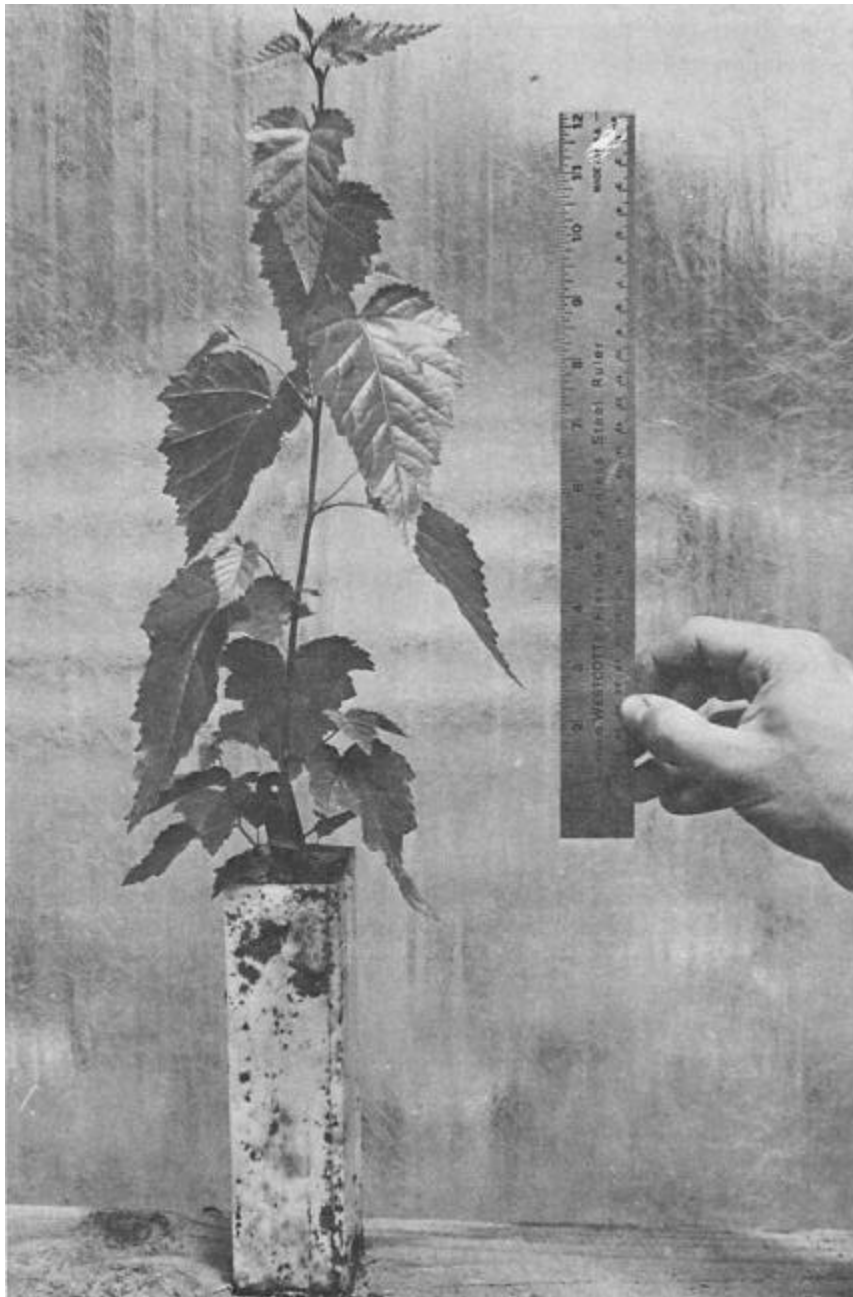


**Figure 1.** — Representative yellow birch seedlings 35 days after germination growing in 5 different soil mediums.

**Table 1.** — Average height (cm) of 65-day-old yellow birch seedlings grown in five soil mediums

Growing Medium	Height (cm)
Jiffy Mix-Plus	34.78
Jiffy Mix-Plus and Sand (1:1)	18.41
Promix BX	12.45 c <sup>1</sup>
Peat-Vermiculite (4:1)	9.63 c d
Peat-Perlite (4:1)	7.53 c d

<sup>1</sup>Figures in the same column followed by the same letters do not differ significantly at the 1 percent level. Basis: five replicates of 50 seedlings per treatment; Duncan's multiple range test.



**Figure 2.** — A typical yellow birch seedling 65 days after germination grown in pure Jiffy Mix-Plus. The seedlings in this growing medium averaged 35 centimeters in height at this time.

The seedlings were hand planted on an abandoned field in western Maine in July of 1975. They will periodically be remeasured to see how long and if the planting medium differences persist. The Zeiset plant bands were removed at the time of planting. Seedlings grown in the Jiffy Mix-Plus and sand combination did not retain their "plug" when field planted. This combination cannot be recommended for future use.

Although the results from this experiment may have been biased due to experimental design constraints, it, nevertheless, points out just how sensitive yellow birch is to growing mediums and fertility levels. Further investigation, especially with fertilization schedules, is needed to determine optimum growing conditions.

#### Literature Cited

1. Tinus, R.W., W.I. Stein, and W.E. Balmer. 1974. Proceedings of North American containerized forest tree seedling symposium. Great Plains Agric. Council Publ. No. 68. 458 p.
2. White, D.P., G. Schneider, and W. Lemmien. 1970. Hardwood plantation establishment using container grown stock. *Tree Plant. Notes* 21 (2):20-25.
3. Phipps, H.M. 1974. Growing media affect size of container-grown red pine. *For. Serv., USDA, North Cent. For. Exp. St. Res. Note NC-165*, 4 p.