PROGRESS REPORT ON FOREST SERVICE HARDWOOD SUPERIOR TREE SELECTION IN THE NORTHEAST

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The number of the superior trees by species that we have located to date on the National Forests are listed in table 1. I haven't seen all of the trees on the White Mountain National Forest; a few might not be accepted, but these figures are approximately correct.

At last year's Central States Tree Improvement meeting at Wooster, Ohio, I introduced our "Hardwood Superior Tree Candidate Report". For those of you who aren't familiar with this I am passing out copies. You can look over the form and have your suggestions or questions ready during the field trip tomorrow.

We have learned that if the minimum standards specified on the hardwood superior tree candidate form were rigidly adhered to, very few trees would be acceptable and the people searching for the trees would become discouraged. Although a small per centage of the selected trees meet these criteria, all are considered to be outstanding in one or more characteristics. Since most of the trees did not meet the minimum standards and the form does not assign a rating to the tree, the choice of accepting or rejecting became a subjective one; but some degree of consistency was obtained because trees were examined and accepted by the same person. However, it is recognized that a lack of an objective scoring is a weakness. It is hoped that this problem will stimulate discussion on tomorrow's field trip, keeping in mind that we will be rating trees of different ages growing in areas with different basal areas and different site indices.

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Table 1.--Superior trees selected on National Forests

National Forest	Species	No. of trees
Allegheny	Prunus serotina	65
Monongahela	Prunus serotina	31
	Liriodendron tulipifera	9
Wayne	Prunus serotina	1
	Liriodendron tulipifera	12
	Juglans nigra	5
	Tilia americana	2
Green Mountain	Betula alleghaniensis	9
	Betula papyrifera	1
	Abies balsamea	5
	Picea abies	1
White Mountain	Betula alleghaniensis	20
	Betula papyrifera	20
	Abies balsamea	20

Although I do not want to go into selection criteria now, I would like to mention some of our experiences and problems in actually getting these trees located. When I first started this work I thought that most of the trees would be found by people doing other work, such as timber marking or compartment examination, who would "happen upon" an outstanding tree and mark it with paint or ribbon. Either then or at a later date they could make the measurements required on the form. But in actual practice most of the trees were located on a project basis where people went out specifically to look for superior phenotypes. Most of the exceptions were on forests or districts where a real spirit of competition had been generated among the employees to see who could come up with the best tree. Based upon our experience on the National Forests, if you are seeking a large number of superior trees, manpower, time, and financing should be allotted just as for any other project.

Since we won't be discussing birch tomorrow, I'll mention two problems encounter in the selection of yellow and paper birch. One is the difficulty of determining age from increment cores, particularly in yellow birch. If bored in the spring the sapwood rings can be distinguished with difficulty but the heart is almost impossible. I've tried staining with phloroglucinol but it doesn't seem to help much.

Another problem is how to handle the question of red heart in paper birch; I am referring to sound heartwood, not incipient rot. Various mill men have told me that it is not just a question of color, but that the red wood is more brash and does not turn well. The Forest Products Laboratory at Madison could not give me a definite answer as to how serious this defect is. Larry Lassen[2] noted that "...the preference shown by mill owners for white wood is perhaps generated by a combination of tradition and actual wood quality difficulty".

[2]Personal comminication.

Assuming that red heart is a defect other than color, how do we select against it. Campbell and Davidson[3] have reported that the ratio of red heart is less in fast-grown trees, and that trees with smooth white boles devoid of large coarse branches have less red heart than coarse open-grown trees on poor sites. Trees with broken branches and other severe injuries also had more red heart. This would suggest that this is an environmental factor. However, I have found that trees of the smooth, white type, of the same age (as closely as I could determine), and approximately of the same diameter growing in close proximity to one another, may have widely differing proportion of red wood.

[3]Jour. of Forestry 39: 63-65. 1941.