MARKING BY ERNST J. SCHREINER

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My objective for this rotation is primarily the production of pulpwood. I am inclined to agree with Svend Heiberg that the present stand should not be carried for too many years. But I am not in favor of an immediate clear cutting because in my opinion this will not get the most out of what is on the ground today.

On the basis of our present knowledge, I can't agree that we have reason to assume that the present stand is genetically inferior to the overstory that was removed in the previous cutting. In my residual stand I have attempted to leave the best phenotypes as seed trees on the assumption that these trees represent genotypes that are as good as those that were removed previously.

In my opinion there is a distinction between crop trees that are left for the production of quality timber in this rotation, and seed trees to be favored as the parents of the next generation. For genetical improvement by mass selection the emphasis should be on the selection of the best phenotypes for seed trees, and the marking of trees to be removed in this and subsequent cuttings should favor these selected parents. These seed trees will, of course, produce some good logs, but this is not my primary objective. It will take a long time to get a large-diameter sawlog out of some of my selected seed trees, but if they are released these trees will produce seed long before they produce large sawlogs. They should therefore provide a good opportunity to control the stand composition through advanced natural regeneration with a minimum of weeding.

On the basis of our present knowledge of the mode of inheritance in the species represented here, I would, today, select the following trees to be favored as the progenitors of the next generation on this site:

Cherry	Red Maple	Sugar Maple	Yellow Birch
2 C 10	14 SM 11	8 HM 8	13 YB 9
11 C 13b	19 SM 12	13 HM 9	44 YB 7
16 C 14	21 SM 12	23 HM 9	
51 C 11	38 SM 15	27 HM 11	
	51 SM 12	32 HM 6	
		44 HM 9	

These trees have been selected on more than genetic criteria. I am aiming at a more equal mixture in the next generation, of cherry, soft maple and hard maple, with some yellow birch. I am under the impression that yellow birch could be grown on this site. There is enough young beech on the ground for future selection if this eventually becomes desirable. The trees listed are among the best phenotypes and they are suitably spaced for sufficient release. in this and the next cutting, to produce an abundance of seed.

As far as possible I have taken out every forked red maple. On the basis of unpublished data on a 16-year-old red and silver maple progeny test (species hybrids and intraspecific crosses) at Beltsville, Maryland, I would never leave a forked red maple unless absolutely necessary. When these control-pollinated progenies were outplanted I realized that for the improvement of red and silver maple it would be essential to select for single, straight stems. For this reason, we cut the top out of every tree at the time of outplanting to determine whether there was sufficient apical dominance to produce single stems. In effect, we deliberately gave these trees a severe ice-breakage treatment. Today there are very few trees without forks or multiple stems. This 2-parent progeny test provides information on the mode of inheritance of forking in red maple. But for the other species present on this site we have no exact information on the mode of inheritance of important forest and use characteristics.

Frankly, I am trying to point out that since we do not have information on the mode of inheritance in these native hardwoods, a "genetical" marking, at present, can be hardly more than the best possible silvicultural marking, with special attention to the release of the selected seed trees. Of course we know that the general principles of genetics apply to our forest trees, but general principles do not supply the information needed for genetic improvement of particular characteristics We need specific information on the inheritance of important characteristics and on the mode of their inheritance (i.e. the proportion of the progeny that can be expected to exhibit the good or poor characteristics) before we can be sure that our good phenotype is a good genotype. For example, this rather wavy, crooked stem in cherry, and the burls that are not due to insect or fungus damage, are they inherited? If so, what percentage of the offspring will have these characteristics? At present we don't know.

Discussion

Morrow Block 44 HM 9, Mergen and Heimburger want to cut the tree, Schreiner picks it as a seed tree.

Schreiner The seed trees that I have indicated are not the only good pheno types in this stand. I suspect that I marked other trees for removal that would make good seed trees, we cant keep them all. It may also be a matter of spacing, depending on where the other markers have located their crop or seed trees. I tried to leave seed trees spaced far enough apart to escape the next cut.