ROOTING CUTTINGS FROM SELECT YELLOW-POPLAR TREES

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Select yellow-poplar trees **are** commonly propagated by grafting. This method is used in lieu of a dependable process for rooting cuttings from mature trees. Own-rooted propagules, however, offer several advantages over grafted stock. Among these are their suitability for clonal testing on a variety of planting sites, testing for degree of resistance to certain root diseases and the elimination of the problems of incompatibility between stock and scion.

A method for producing own-rooted clones of yellow-poplar has been presented (McAlpine 1962). This method pointed out the ease with which softwood cuttings could be rooted under mist when prepared from young, rapidly growing stump sprouts. The value of this method lay in the multiplication of numerous ramets of several clones to be used primarily as research tools.

The ability to store such cuttings under refrigeration for periods up to two weeks without diminished rootability was determined by Steinbeck and Porterfield (1967). This enabled a worker to collect cuttings from sources spaced miles apart and store and ship these to a central area where mist beds were available for rooting.

Using this knowledge we have been able to bring together at Athens a number of yellow-poplar clones from widely scattered parts of Georgia and adjacent states. However, an obvious disadvantage of using stump sprouts to propagate a select tree is that the tree must be cut and is lost for other uses.

Kormanik and Porterfield (1966) were able to root newly-formed epicormic branches almost as well as stump sprouts. Sprouting was stimulated by placing girdles part way around the circumference of the bole at intervals of 3 or 4 feet from stump height to the base of the crown. These partial girdles were oriented on opposite sides of the tree so that on a given log face, the girdles were 6 to 8 feet apart. This effectively removed inhibition of the suppressed buds without severely damaging the tree. During the summer of 1970 epicormics produced by this process were collected from girdled trees in the piedmont and mountains of Georgia and rooted and lined out in a clone orchard.

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Although this method has been used successfully, it has disadvantages. All trees do not produce sprouts even though girdles are improperly made. Old trees produce fewer sprouts than young trees. And, trees are usually selected because, among other things, they show a tendency to have fewer epicormics than comparison trees. The task of girdling a tree is difficult and time-consuming. The larger and taller the tree the more difficult is the job. Girdles improperly made are almost sure to be bridged by callous. And, to obtain adequate sprout formation neighboring trees must be felled to expose the bole to sunlight. These factors and the fact that a tree girdled from top to bottom is not aesthetically pleasing, limit the usefulness of the girdling method.

We have known for some time that it was possible to severely prune back the top of a well-established, grafted tree and cause the scion to sprout. Cuttings made from sprouts produced by the scion can be rooted reasonably well (McAlpine 1965). Own-rooted propagules thus obtained and outplanted can be used as a source of additional cuttings, and the clone thus multiplied. This method presupposes that the selected tree can be grafted in sufficient numbers so that at least one individual can be sacrificed for propagation purposes.

Recently we have taken a new approach to obtain sprouts from trees and at the same time we hope to reduce the time and effort required and to increase the certainty of sprouting. This involves pruning the crown of mature trees. The degree of pruning is yet to be determined, but we have begun a study which includes shooting out or sawing out the top or uppermost branches, pruning or shearing one side of the crown leaving branch stubs 2 to 4 feet long, and in like manner, pruning off all branches from the base of the crown up to about 1/3 residual top. All except shooting require climbing into the crown. This method offers an advantage over the girdling method in that the removal of surrounding trees to allow additional sunlight to reach the treated parts is not required.

Preliminary work has shown that conditioning a tree for sprouting by either girdling or pruning should be done during the dormant season. Any visible indication of beginning of bud growth in early spring means that treatment will likely be ineffective or that sprouting will be delayed until too late in summer for rooting.

Trees in the current study were treated in late February. Two trees in each of three age classes were treated by each of the four methods described. An inspection in mid-May revealed that sprouting was well underway on almost all trees. Thus far 1600 cuttings have been collected and placed in mist beds. Information on success in propagation will be available next year; however, we are confident that select trees can be propagated by one or more of these pruning methods.

LITERATURE CITED

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