NURSERY BEHAVIOR OF RED PINE STOCK OF DIFFERENT SEED ORIGINS

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The importance of seed origin is becoming more widely recognized in American forestry. Since 1939 the U. S;. Department of Agriculture has had a seed policy which stressed this matter., Tree seed certification laws were enacted by the States of New York in 1939 and Georgia in 1941. In 1949 a group of West Coast forest industries set up their own tree seed certification rules.

Aside from these formal rules and regulations, a great many foresters have begun to believe in the need for growing trees from seed of good origin, As a result, forest nurserymen have had to segregate their seed and stock more closely than before.

This trend raises an important question for forest nurserymen Is there any way in which they can distinguish seeds of different origin or stock grown from such seeds ? To shed some light on this question, data from 28 sources of red pine (Pinus resinosa) were assembled (table 1). The sources were grouped in-to 8 seed-collecting regions and were compared on the basis of number of cleaned seeds per pound, germination in the laboratory and in the nursery, tree percent for 1-0 stock, and average weight of 1-0 seedlings,

There are broad indications of a relationship between region and seed size, In general, the seed from the southern parts of the range of red pine (Brainerd-Cameron, central Wisconsin, Lower Michigan, and New England) is larger than that from more northerly areas. More data from the different collection regions which have not yet been completely analyzed, might strengthen these trends, especially for those regions which are represented by only two or three observations.

Since there is also a distinct trend for larger seeds to produce larger 1-0 seedlings, there may seem to be some possibilities of -distinguishing seed or stock from different collection zones, However, when the variation within collection regions is considered, it is obvious that assignment of any individual seed sample to a definite area on the basis of seed or seedling size would be very hazardous Furthermore, neither laboratory germination, nursery germination, nor tree percent show any racial relationship, All showed considerable local variation within collecting regions.

Table 1.--Seed and stock characteristics of red pine from several seed origins[1/]

Seed collecting region	Sources	Cleaned seeds per pound	Germination		Tree percent 1-0 stock	Average dry weight 1-0 seedlings
			Laboratory	Nursery		
	Number	Number	Percent	Percent	Percent	Mg.
Brainerd-Cameron	2	47,250(45,600-48,900)	84(71-96)	66(54-78)	56(36-76)	46(42-51)
N. E. Minnesota	5	55,940(49,500-63,000)	68(42-92)	53(44-60)	42(34-50)	42(37-46)
Head-of-Lakes	5	55,040(51,400-59,500)	51(30-70)	50(24-62)	45(23-59)	43(32-59)
Northern Upper Peninsula, Mich.	2	61,200(59,800-62,600)	47(40-54)	54(51-56)	47(44-50)	38(31-44)
N. E. Wisconsin - Southern U.P. Mich.	5	54,520(52,400-57,200)	58(46-67)	53(44-59)	42(33-54)	52(47-55)
Central Wisconsin	4	46,625(40,400-49,560)	49(35-64)	52(25-67)	47(20-69)	55(46-69)
Lower Michigan	3	51,900(47,900-55,600)	55(24-72)	46(24-62)	31(19-58)	49(42-54)
New England	2	48,500(46,800-50,200)	75(70-80)	66(65-68)	51(50-52)	56(55-56)
Total	28	52,990(40,400-63,000)	59(24-96)	54(24-78)	44(19-76)	48(31-69)

1/ Stock was grown in the Cass Lake Nursery, Chippewa National Forest, Minnesota. Figures in parentheses represent the range of values upon which the averages are based.

The results boil down to this. If a nurseryman has a lot of red pine seed, he cannot tell its origin from ocular or readily measurable characteristics. If the cleaned seed runs over 56, 000 per pound, it probably is from the northern part of the range, and if it runs below 49, 000 per pound, it probably is from the southern part of the range. Even these statements must be made as probable rather than absolute diagnoses. Similarly, if he has 1-0 seedlings which are larger than average, they may be from southern seed; if they are smaller than average, on the other hand, they may well be from northern seed. Specific sizes or weights would have to be worked out for individual nurseries.

This lack of good diagnostic characteristics of red pine seed or stock is not unusual. The same general condition has been found for Scotch pine in Europe, where this problem has been given a great deal of study in many countries. Physical, chemicals, and physiological tests, while they have given some leads, all have failed to provide reliable bases for determining provenience, or origin, of seed or nursery stock.

The inevitable conclusion is that there is no substitute for seed certification. The nurseryman must have reliable evidence that the seed he obtains is from the locality named. (Seed of unknown source should not be used.) This may mean collection by his own agency, legal certification (where state laws are in effect), or purchase from known reliable collectors or dealers.

TREE SEED LAWS AND POLICY

Editor's note. ---Tree Planters' Notes invites articles on laws, regulations, and policies concerning seed origin and labeling from all localities and organizations which have such, even if they are not observed.

Extracts of the laws from Georgia and New York follow. The laws themselves are too long and ramified to be printed in their entirety here, but copies of the complete law can be had by writing the State.