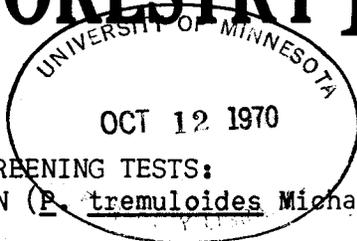




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RESULTS OF ASPEN SCREENING TESTS:

I. SEED SOURCES OF QUAKING ASPEN (*P. tremuloides* Michaux)

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In connection with the forest-tree genetic investigations sponsored by the Maria Moors Cabot Foundation for Botanical Research of Harvard University, a plantation was established in eastern Massachusetts during the period 1951-54 with the objective of screening various seed sources and hybrids of native and exotic aspen of possible usefulness in further tree genetic and breeding studies. Since the number of plants per lot was frequently small, and the available planting area limited, the screening tests were largely unreplicated in space and time.

This report is concerned with the performance of 29 seed sources of quaking aspen established in Plantation VIII, located on the former Case Estate in the village of Weston, Middlesex County, Massachusetts, about 10 miles west of Boston (Lat. 42° 22'N.).

The seed lots, collected from one to several native trees in the portions of the range sampled, were supplied by cooperating individuals. After cleaning, the seed was sown on the surface of finely ground sphagnum moss in shallow clay pots and watered from below. After the seedlings had reached a height of ca. 1/2 inch they were pricked from the sphagnum and lined-out in greenhouse flats. In mid-June the plants were transplanted into nursery beds and grown to suitable outplanting size (18" - 24"). Although this treatment permitted outplanting of low latitude and low elevation seed sources and most hybrids as 1-0 stock, those from short growing season sources (high elevation or latitude) were typically dwarfed and were held for another season in the nursery and outplanted as 2-0 or 1-1 stock.

All of the Plant. VIII site was plowed and harrowed throughout the 1950 season, the year prior to the first outplantings. Thereafter the remaining unplanted area was kept "black" until the final planting in spring, 1954. The planted portions of the plantation were maintained under clean-cultivation for a period of two years after planting. Seed lots were outplanted at random in row plots of variable size. A uniform spacing of 5 x 5 ft. was used.

Because of the high phenotypic quality of many aspen stands in the Rocky Mountain area, special interest was attached to the performance of these sources. Survival of the 18 Rocky Mountain seed sources through 1954, at which time the accessions of 1950, 1951, and 1952 were, respectively, five, four, and three years of age from seed, was relatively high: 41 - 88% (Table). But all the plants were stunted in growth and unhealthy in appearance. By 1962, at the age of 13, 12, or 11 years, only two of 147 trees in the 18 sources were living and these were dwarfed and clearly ill-adapted. A similar reaction was demonstrated by the single high latitude Yukon Territory source. The three Washington state sources survived in high percentage through the 1954 season but were of low vigor and all succumbed prior to 1962.

In spite of the shortcomings of the design, and consequent lack of precision in defining differences between within-region sources, the survival results suggest that western and high latitude sources of quaking aspen hold little promise for planting in eastern Massachusetts. Further, the similarity in growth and survival of the Lake States sources with those of Massachusetts and other Northeastern sources when grown in eastern Massachusetts suggests that western and high latitude sources of quaking aspen would be unsuited for planting in the Lake States as well.

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TABLE

P. tremuloides seed sources.

(Survival and average height classified by geographic area of source and year of accession.)

Source ^{1/}	Acc. Year ^{2/}	No. Sources	No. Plants	Survival (%) - Av. Ht. (Ft.)			
				1954		1962	
				%	Ft.	%	Ft.
(A) NORTHEAST (Mass., N.H., Pa.)	1950	3	171	94	7.9	32	23.0
(B) LAKE STATES (Wis., Mich.)	1950	3	21	81	4.6	43	18.0
(C) NORTHERN AND CENTRAL ROCKY MTS. (Mont., Idaho, Colo., Utah)	1950	8	80	68	3.1	1.3	6.0*
	1951	4	31	45	2.2	0	----
	1952	3	11	82	1.4	0	----
(D) SOUTHERN ROCKY MTS. (N. Mex., Ariz.)	1951	1	17	41	2.4	0	----
	1952	2	8	88	1.7	12	10.0*
(E) WASHINGTON	1950	3	30	67	3.3	0	----
	1952	1	7	100	1.7	0	----
(F) YUKON TERR.	1951	1	12	58	1.0	0	----

^{1/}Latitude and elevation limits of the source areas follow:

- (A) Lat. 41-30 to 43-55 N.; Elev. 800 - 1800 Ft.
 (B) Lat. 44-09 to 46-20 N.; Elev. 800 - 1200 Ft.
 (C) Lat. 37-00 to 47-33 N.; Elev. 2240 - 9000 Ft.
 (D) Lat. 32-43 to 35-55 N.; Elev. 7200 - 9800 Ft.
 (E) Lat. 47-00 to 48-20 N.; Elev. 100 - 1700 Ft.
 (F) Lat. 60-40 N.; Elev. 2000 Ft.

^{2/}"Accession year" is also the year propagated and thus the first year of growth from seed.

* One surviving plant.