Spruce Seed Source and Species Trial

Lake States Forest Experiment Station

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This area on the Eagle River district of the Nicolet National Forest was planted with 2-2 spruce stock of several species and origins (table 1) in 1936 under a partial overstory of aspen and birch. Other plantations were established in Minnesota and Michigan the same year without a protective overstory, but they were lost as a result of the severe drought of 1936. The overstory on the Wisconsin plantation was removed gradually by cutting and girdling; removal was completed when the stand was about 20 years old.

Although the number of seed sources is too small to permit developing any pattern of racial variation within the species involved, the studies do point toward some outstanding seed sources of both white spruce and Norway spruce.

White spruces from Angus and Douglas, Ontario, outgrew white spruce from Florence, Wis. (the nearest local source), in height by 12.8 and 13.6 percent respectively at the age of 15 years, and the trees of these Canadian origins continue to develop well.

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Table 1.--Origin of spruce seed collections

Collection number	Place of origin	Collection date	Kind of collection[1/]
	WHITE SPRUCE (Picea glauca (Moench) Voss)		
32-33	19 miles W. of Port Arthur, Ontario	9- 2-28	2
39	Victor Hill Road, Superior N. F., Minn.	9-15-28	1
255	Chippewa N. F., Minn.	1928	4
256	Near Angus, Ontario	1929	4?
257	Near Douglas, Ontario	1929	4?
270	Black Hills; through dealer at Custer, S.D.	1931	3
273	Near Florence, Wis.	9-30	4?
	NORWAY SPRUCE (Picea abies (L.) Karst.)		
131	Northern Europe - purchased from dealer	1929?	4?
134	Mozyr District, White Russia, USSR	1929?	3
135	Bryansk Forest Expt. Sta., USSR	1929?	3
137	Gomel District, White Russia, USSR	1929?	3
138	Forest Res. Sta. U. of Belgrade, Yugoslavia	1929	3?
140	Between Mauston & Wis. Dells (formerly Kilbourn) Wis.	9-14-30	1
	SIBERIAN SPRUCE (Picea obovata Ledeb.)		
132	Siberia - purchased from dealer[2/]	1929	4?
	RED SPRUCE (Picea rubens Sarg.)		
271	Pisgah N. F., N. C., and Unaka Ranger District, Tenn.	1931	4
272	Monongahela N. F., W. Va.	1931	4
	BLACK SPRUCE (Picea mariana (Mill.) B.S.P.)		
N	Chippewa N. F., Minn.	1930	3
	SAKHALIN SPRUCE (Picea glehni (Fr. Schmidt.) Mast)		
90	Jozanekei, near Sapporo, Japan	1928?	4
	ORIENTAL SPRUCE (Picea orientalis (L.) Link.)		
133	Groosya (Georgia), Cobovletse Nursery, Caucasus, USSR	1929	3
	SERBIAN SPRUCE (Picea omorika (Pancic) Purkyne)		
139	Forest Res. Sta. U. of Belgrade, Yugoslavia	1929	3?

1/ 1 = individual tree; 2 = small group; 3 = limited locality; 4 = general and mixed.

2/ The identity of this collection is very questionable. It appears to be a collection of Picea abies of unknown origin.

Norway spruce from the Mozyr, Bryansk, and Gomel Districts in the U.S.S.R. similarly outgrew Norway spruce collected in Wisconsin from trees assumed to be of German origin by 12.4, 13.9, and 11.7 percent respectively. Norway spruce from Yugoslavia grew slowly and is highly susceptible to Chermes abietis; two severe outbreaks have occurred during the past 6 years. All other seed sources showed little or no damage from this insect.

Serbian spruce (Picea omorika) has shown very low survival, but some of the surviving individuals have developed well. They have recently begun to flower and have been used in a program of reconnaissance crossing within the genus Picea. The fact that the few surviving individuals--of the original 900 planted--are developing so well points to the importance of bulk plantings of exotics to be tested. By planting large unreplicated field tests, it may be possible to select a few individuals adapted to the test climate; in small formal replicated tests, they may not be found.

The red spruce (P. rubens) used in the tests originated in the southern portion of the range of the species, in West Virginia and North Carolina--Tennessee. Although survival and growth usually have been poor, a few individuals have developed relatively well. Some have produced a considerable number of flowers and have been used in the reconnaissance crossing within the genus.

Sakhalin spruce (P. glehni) from Sapporo, Japan, and Oriental spruce (P. orientalis) from Georgia, U.S.S.R. were almost complete failures. The few surviving individuals are very small.

Future work in the study area will emphasize controlled crossing between seed sources in white spruce and Norway spruce. A number of trees have been selected and marked for this work. These collections were based on quality and vigor and on unusual characteristics of branching, needles, and stem.