

RESEARCH REPORTS

Chairman: H. C. Buckingham

THE POSSIBILITIES OF NORWAY SPRUCE IN MAINE¹

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A great deal has been said pro and con about the use of exotics in Forestry. The most recent article is in the Journal of Forestry for August. It is entitled, "Exotics Can Succeed in Forestry as in Agriculture", and was written by Frank R. Moulds, an Australian. It covers the ground.

As everyone knows the two exotics used most widely in early Northeastern planting were Scotch pine and Norway spruce. The first because of poor form soon became unpopular, but, as Kipling says, "That's another story." Results with the latter were much more satisfactory.

There were perhaps two principal reasons why our predecessors used these species, or any other European species: first, we were learning our silviculture from Europe and volumes had been written on the management of European timber trees; second, planting always assumes undue importance when forestry is in the pioneer stage, and seeds and planting stock were more readily available in Europe than at home.

Neil Hosley reported in Harvard Forest Bulletin no. 10, "Norway Spruce in the Northeastern United States" (1936), that up until that time approximately 120,000 acres or 21 percent of all planting in New England and New York had been with Norway spruce. In this excellent publication Hosley paints a very bright picture of the adaptability of Norway spruce to Northeastern conditions. Later, planting of the species decreased.

Twenty years or more ago I visited Elwood Wilson's Norway spruce plantations at Grand'Mere, P.Q. and was very much impressed. My interest increased as some of our older plantations in Maine showed what the species would do-- and also couldn't do. In 1955 I visited Europe and saw magnificent forests of spruce and silver fir.

I still considered Norway spruce of minor importance to us in Maine, but when I learned last spring that 250,000 trees had been shipped to planters I decided that we had better find out what we could about the species. Several other Maine foresters have come to the same conclusion.

¹ This report was presented at the First Session, following the Regional Summaries, because of its bearing on the field discussion in the Penobscot Experimental Forest. Editor.

Sponsored by the Maine Agricultural Experiment Station, M. Czapowskyj, a graduate of the University of Munich with two years' experience in the Black Forest, is carrying on site studies, and I have been investigating plantings established 25 to 30 years ago.

A few case histories of plantations visited this summer or in previous years may be of interest to you:

1. A plantation in the Androscoggin Valley on light sand, 21 years from seed, averages 8 feet in height.
2. A 90-acre plantation near Waterville, established 30 years ago, has produced 20 to 25 cords per acre on clay loam, and less than half that on light, excessively drained soil. The tallest trees on the better sites measure 55 feet and less than half that on the poorer sites. Part of this area has been thinned.
3. A 22-acre plantation near Bingham had a volume of nearly 30 cords per acre 32 years after planting. A white pine planting just across a woods road has a mean annual growth of a little over a cord for the same period. The spruce has been thinned.
4. A plantation established in 1919 on good potato land in eastern Penobscot County showed a volume of 24 cords per acre 33 years later.
5. The oldest planting observed was near Farmington. Established in 1910 with stock from Germany grown from Scandinavian seed and measured 44 years later, there was an average of 17.56 cords per acre on about 250 acres. One block of 68 acres averaged 35.70 cords. Grown on hardwood soil, competition had been keen. Porcupines had killed or damaged over 50 percent of the trees.
6. An extensive planting established a few years later on a burn in north-eastern Penobscot County has done very poorly.

The above is part of the record but an investigator is certain to hear of more good plantations than poor ones. Since our plantations are not extensive and for the most part young, let us hear what some of our European colleagues have to say.

Kobstler of Munich--In the northern Black Forest Norway spruce does best on heavy moist soils rich in nitrogen. Its water requirements are relatively high. It is a cold weather tree.

Dannecker of Wurttemberg--It thrives on rich, moist soils in the mountains but does well on rather poor sites if there is sufficient atmospheric humidity. It has little need of deep soils and avoids stiff clays. In lowlands it grows rapidly at first and then slows down. In the Black Forest Norway spruce isn't planted below 1000' and is found at 4,900'. It grows at near sea level in Norway and proceeding south grows at increasingly higher elevations. The Swedes recognizing the suitability of mountain races farther south to lower elevations at home, import seed and grafts from selected trees in the French Jura and seed from the Harz Mountains of Germany.

From the standpoint of soils, most of our abandoned farm land in Maine appears to be satisfactory for Norway spruce. Our climatic conditions are suitable, for we surely have cold weather and on most areas sufficient ground and atmospheric moisture. Growth in southern New England is doubtless better but we should produce wood of higher quality in Maine.

Although we should probably not recommend the planting of large blocks of Norway spruce yet, it is a species which does well in mixture with other conifers. We have several plantations in which it has been mixed with white pine in alternate rows and a large volume of wood produced in 30 years but both species are attacked by weevil; the white pine is coarse branched because of lack of competition with the slower starting spruce and much of the spruce has been suppressed. Mixed in groups or bands the spruce has done well with both red pine and white spruce, although we have few examples of these mixtures.

It can be planted on cut-over land to reinforce regeneration if rabbits aren't too numerous, in openings in old fields coming back to timber, and scattered in groups through brushy areas. It is very tolerant. It has been used successfully in a mixture with other spruces in New Brunswick. Commercially, it lends itself to intensive management because of the value of its thinnings for pulpwood.

Norway spruce has many enemies but none as serious as the roe deer at home. The white pine weevil and porcupine have already been mentioned but it recovers more easily from the weevil than white pine. Red squirrels may nip off leaders year after year and eat large quantities of seed. Both porcupines and squirrels can be controlled. In Maine the gall aphid is present but not serious. A disease (Cytospora) has recently been found in one large planting in Maine; many trees on poorer soils are infected and a few killed. This could be very serious.

Seed sources. Mountain seed from central Europe has been used in our nursery with satisfactory results and we have found no examples of lack of resistance to cold. However, many varieties of Norway spruce are recognized in Europe and it is probable that certain ones would be of great value to us. Last spring we established small beds with seeds from nine different sources in the Harz and Black Forest Regions. Some of the forests represented produce timber of outstanding quality.

To summarize: I believe Norway spruce has a place in our planting program because of its adaptability to our soil and climate, its potential high quality, and the continuous availability of good seed. Indications are that with care in its culture, including thinnings when needed, it will produce wood nearly as rapidly as our pines and perhaps more rapidly than our white spruce. It has serious enemies but thus far none that we can't cope with. Certainly we should continue to plant more white pine and red pine, and also white spruce, but let's not slight his European cousin. We can not afford to disregard a tree capable of attaining magnificent form, producing pulpwood from thinnings at 30 years, and less an exotic than native spruce from parts of the Lake States region. It can play an important part in our forestry.