

RESEARCH NOTE NO. 11

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A PRELIMINARY REPORT ON TREE PLANTING

AS A GORSE CONTROL MEASURE

By

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#### INTRODUCTION

Foresters and agriculturists have often noted the phenomenon of a plant, transplanted outside its natural range, making much greater growth in the new environment. Sometimes the accelerated growth habits of an exotic plant greatly increase its value to man, i.e. Monterey pine (Pinus radiata) in New Zealand. In other cases the plant becomes a serious pest as has gorse in southwestern Oregon.

Gorse, or Irish furze (Ulex europaeus), a leguminous shrub which closely resembles Scotch broom, has been found in every coastal county and in the majority of Willamette Valley counties in Oregon. The plant was brought from the British Isles about sixty years ago for use as an ornamental by one of the early settlers of the Bandon area.

This plant will grow on any type of soil found in the coastal region of Oregon and is so tenacious in its growth and reproductive habits that it will crowd out all minor vegetation which may be initially associated with it. The species is high in oil content and dead, dry material makes up all save the outer one foot of the crown of each shrub. These characteristics and the dense, almost impenetrable thickets in which it grows on the Oregon Coast make it an extreme fire hazard during periods of low humidity.

#### THE EXTENT AND NATURE OF THE GORSE PROBLEM

From small initial plantings near Bandon, Oregon gorse has spread until today it has heavily infested over 25,000 acres in western Oregon

and is threatening much valuable pasture and forest land. Control of this plant on valuable agricultural land has been achieved through use of various chemicals and grazing animals (sheep and goats).<sup>1</sup> However, neither of these methods is economically feasible for the large infested areas of forest lands.

Field observations of the growth habits of gorse have indicated that it is very intolerant to shade. Heavy stands of gorse have been noted in areas adjacent to timbered lands, but it has not been found growing under forest shade. Therefore experimental plots were established to determine if satisfactory control of gorse could be achieved by planting forest tree species which might survive the intense early competition and later overcome the less tolerant shrub.

The purpose of the experiment was to determine the relative abilities of Douglas fir (Pseudotsuga taxifolia) Port Orford cedar (Chamaecyparis lawsoniana), lodgepole pine (Pinus contorta), and maritime pine (Pinus maritima) to survive the early competition of gorse and to determine if one or more of the tree species might eventually eliminate this shrub.

#### TREE PLANTING

In December, 1946 a plantation of Port Orford cedar and Douglas fir was established on an area near Port Orford, Oregon. The location selected was flat and tended to be swampy during the rainy season. The soil was quite shallow, with a layer of hardpan occurring about three inches below the surface.

The area had been heavily infested with gorse before it had been burned the previous year by the Oregon State College School of Agriculture. At the time of planting, the gorse was a maximum of one-foot tall and was growing in clumps interspersed with small openings.

<sup>1</sup>Hill, D. D. "Gorse Control" Oregon State College Information Circular 450, 9 p., 1949



Plate Number 1. Stake is approximately 66 inches tall.



Plate Number 2. Clipboard is approximately 12 inches tall. This cedar was completely covered by the gorse shown in plate number 1. This tree made the poorest growth of any found in this plantation.



Plate Number 3. Stake is approximately 68 inches tall. This is an example of the vigorous growth many of the cedar seedlings have made.



Plate Number 4. Portion of Port Orford cedar plantation—each stake marks a seedling.



One thousand Port Orford cedar seedlings and 100 Douglas fir seedlings were planted six feet apart in rows eight feet apart. The seedlings were wrapped in peat moss with seventeen-pound test paper and planted with a planting bar.

In the spring of 1949 plantations of lodgepole pine, maritime pine, and Port Orford cedar were established in the same area.

#### RESULTS

The plantation established in 1946 was checked briefly from time to time until the fall of 1952 when a portion of the area was carefully examined and six-foot stakes set to mark the trees found. The gorse cover on the area at the time of examination was quite heavy and ranged from three to six or more feet in height. At least 80 per cent of the planted Port Orford had survived the intense competition of the gorse and 99 per cent of the trees which had survived had made fair to excellent growth. Many of the trees found were completely covered by thickets of gorse (See plates No. 1 to 4), but even these seedlings showed excellent color and good form. No Douglas fir seedlings were found. It is believed that the heavy rabbit population in the area was at least partially responsible for destroying these trees since previous checks had disclosed numerous examples of seedlings nipped off by rabbits.

An examination of the plantations established in 1949 was made in the fall of 1952. The gorse cover was very heavy in spots over the planted areas even though all had been burned prior to planting (See plate No. 5). Both species of pine made good growth in open spots and in areas with light gorse cover, but the heavy gorse thickets stunted or killed these seedlings (See plates No. 6 and 7. Maritime pine is the only pine pictured in this report). The Port Orford cedar plantation was very largely covered by heavy gorse which made finding the seedlings very difficult. Those found



Plate Number 5. Gorse made the growth shown in this photograph in three years.

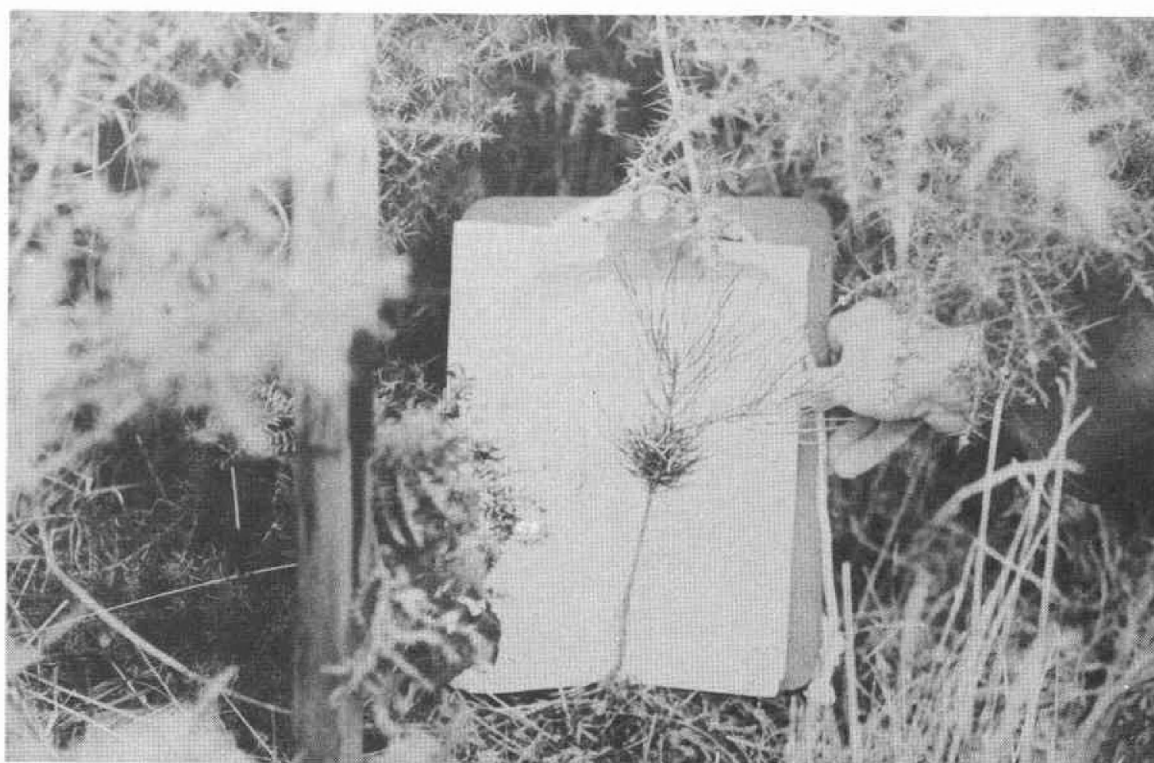


Plate Number 6. Closeup of seedling shown in plate number 5. Clipboard is approximately 12 inches tall. Stunted condition of pine seedling is typical of seedlings found in areas of heavy gorse.



Plate Number 7. Typical of the vigorous growth made by pine seedlings in open areas. This tree is approximately 3 feet tall.



Plate Number 8. Typical of the growth made by pine seedlings in areas of light to moderate gorse cover.



were, for the greater part, not as thrifty as the trees planted in 1946, but appeared better able to compete with heavy gorse infestation than either species of pine.

The intensive 1952 examination of the plantations indicates that of all the coniferous trees tried thus far, Port Orford cedar currently appears best able to compete with gorse. The results of brief, periodic checks of the plantation established in 1946 from the spring of 1947 until the present date have shown that the seedlings have maintained the same relative position with the gorse. The tops of most of the Port Orford seedlings have remained approximately six inches below the tops of the gorse (See plate No. 3.) Therefore, if the trees maintain their present rate of growth, they should overtop the gorse, which has already reached near maximum height, in a very few years. Thus, it appears possible that this plantation of Port Orford cedar will eventually create sufficient shade to eliminate the gorse from the planted area. This area, however, is within the optimum range of Port Orford cedar, and it may be that outside its rather limited natural range, the species would be less able to compete with gorse.

#### SUMMARY

Gorse, or Irish furze, a native of Europe, has spread over southwestern Oregon and threatens much valuable agricultural and forest land. Because this plant is intolerant to shade, it was decided to plant several coniferous species in areas heavily infested with gorse. Plantations of Port Orford cedar and Douglas fir were established in 1946 and similar plantings of Port Orford cedar, maritime pine, and lodgepole pine were made in 1949 to test the relative abilities of these coniferous species to withstand the intense, early competition of gorse and to eliminate this shrub by shading. Areas chosen for planting were burned over prior to establishment of the plantations. Intensive examination of the plantations in 1952 indicates that of the tree species tried Port Orford cedar appears best able to compete with gorse and that it could, if early trends continue, eventually eliminate this shrub from the planted areas.

#### ACKNOWLEDGEMENTS

The 1946 plantings were accomplished under the direction of Sam Miller of the Oregon State Board of Forestry. Actual planting was done by Lawrence DeOs of the Coos Fire Patrol Association. Later burning and planting was done by the Coos Fire Patrol Association in cooperation with research personnel of the Oregon State Board of Forestry. John B. Woods, Jr. was responsible for much of the planning for the later forestry phases of the experiment.

The chemical and grazing phases of the project were carried on concurrently under the direction of Dr. D. D. Hill of the Oregon Agricultural Experiment Station.

# GORSE EXPERIMENTAL AREA

ON W. J. SWEET TRACT

CURRY COUNTY

## L E G E N D

SCALE : 1 INCH = 200 FEET

①

LOCATION OF PLATE

PLANTING BOUNDARY

FIRE BREAK

ROADS

