

AN ABSTRACT OF THE THESIS OF

Robert F. Lefebvre for the degree of Master of Science in Forest Resources presented on December 5, 2013

Title: The Combined Effects of Vegetation Control and Seedling Size Class on Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) Seedling Productivity on a Site in Oregon.

Abstract approved:

Robin Rose

Controlling competing vegetation with the application of herbicides and increased seedling size at planting has been shown to increase seedling survival and growth. These two important reforestation tools have often been studied independently of each other, limiting comparisons that can be made between them. This study utilized a factorial treatment structure to test for interactions among four different vegetation control treatments and three seedling size classes in a randomized complete block design. The first year results reported in this thesis indicate that the effects of vegetation control and seedling size are additive, and stem volume increased with vegetation control and increased seedling size. Stem volume ranged from 6.2cm³ for seedlings in the smallest size class that received a fall site preparation only to 36.2cm³ for seedlings in the largest size class that received a fall site preparation and a spring release. Seedlings that were excavated after the first growing season showed that competition negatively impacted root growth. Monthly vegetation surveys

indicated that herbicide application was effective in reducing competing vegetation to below 15% in treated plots, increasing cumulative soil moisture by 21% throughout the growing season. The spring release treatment also altered the vegetation community, reducing forbs across the growing season in treated plots but had little effect on perennial species. Future measurements will continue to assist nursery and land managers in decisions regarding nursery cultural practices and vegetation control treatments.