Early growth of introduced and native grasses on lupine-enriched soil

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Introduction

Ecological studies have shown that increased levels of soil nitrogen favor fast-growing introduced plant species, such as annual grasses. One source of elevated nitrogen is N-fixing plants, which have been shown to promote introduced species (Maron and Connors, 1996; Kolb et al., 2002).

The Bodega Marine Reserve (BMR) is home to a large population of native Lupinus arboreus (yellow bush lupine). These lupines host nitrogen-fixing bacteria in nodules on their roots. As a result, the soil underneath bush lupines is rich in nitrogen from leaf litter and excess nitrogen secreted at these nodules. After lupines die, the nitrogen-enriched soil coupled with the sudden availability of bare ground creates patches of terrain which are prime candidates for invasion.

The focus of this study is to compare early rates of growth, germination, and final biomass between grasses grown on lupine and non-lupine soil.

Hypotheses:

1. Native and introduced grasses will have higher rates of germination on lupine soil than on non-lupine soil.
2. Introduced annual grasses grown on lupine soil will have increased initial growth rates and biomass accumulation.

Methods

Two soil types used:

- Soil from under lupine (LUP)
- Soil from under grassland, away from lupine (NL)

Six grass species grown:

- Bromus diandrus
- Lolium multiflorum
- Vulpia bromoides
- Holcus lanatus
- Bromus carinatus
- Hordeum brachyantherum

References


Acknowledgments

This work was supported by grant ROBO-043251 from the National Science Foundation to S.L. Williams. Thanks to Dan Gruner and the Strong Lab, Cynthia Hays, Rachel Fontana, and Martha Y. Diaz.

References


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