

ABSTRACT OF THE THESIS

Germination of Raphanus raphanistrum L.

in Controlled and Field Environments

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The effects of laboratory storage, leaching, stratification, and field storage on the germination of isolated seeds, seeds in cut fruit segments, whole fruit segments and indehiscent siliques (pods) of Raphanus raphanistrum L. (wild radish) at alternating temperatures (5/15, 10/20, 15/25, and 20/30°C) in the light and dark were examined.

Germination immediately after harvest (July) was greatest in isolated seeds (50%) and was followed in decreasing order by cut fruit segments, whole fruit segments, and pods. Germination was consistently greater in the dark, but the effect was less as germination temperature increased. Storage at room temperature increased germination. Leaching immediately after harvest increased germination of isolated seeds, but decreased germination of the other seed types. Leaching of seeds stored for 6 months in the laboratory generally reduced germination of all seed types. Stratification of freshly harvested and after-ripened seeds decreased germination. Drying increased the germination of isolated seeds stratified for 18 weeks. Germination of field stored seeds at 3 soil depths (surface, 2, and 7 cm) was determined in the laboratory at 6 week intervals. Germination of isolated seeds and whole fruit segments from the 2 and 7 cm depths increased from July to September,

decreased in October, and again increased during early December. A general decrease in germination occurred after February for surface seeds and after April for seeds taken from the 2 cm depth. This decrease in germination of shallow buried seeds after the winter period was due to secondary dormancy which could be broken by stratification (4°C). Germination of seeds taken from 7 cm decreased with stratification. Drying increased the germination of seeds stored for 36 weeks in the field. In situ germination was greater at 2 cm than at 7 cm. The highest flush occurred during August. The dormancy and germination characteristics of a population of R. raphanistrum are discussed in relation to this species' success as a primary invader during secondary succession.