Factors affecting the germination ecology of turnip weed (*Rapistrum rugosum*) in the Northern Grain Region of Australia

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Summary Turnip weed (*Rapistrum rugosum* (L.) All.) is one of the rapidly emerging weeds in the Northern Grain Region (NGR) of Australia. Limited studies are available on the germination and emergence of turnip weed from the NGR. There are also areas in the NGR with varying rainfall and climatic conditions. The maternal environment can be a major determinant that decides the germination and dormancy characteristics of weeds. Therefore, two weed populations were chosen from Gatton and St George, high and low rainfall areas, respectively, to study the pattern of germination and emergence. Under the laboratory environment, lack of germination was observed in the freshly harvested seeds with siliquae intact. However, when the silique was removed, germination improved to 91 and 87% from the populations from Gatton and St George, respectively. In order to understand the level of seed bank persistence, seeds were placed in permeable nylon bags and buried at three depths: 0 (surface), 2 and 10 cm. The seeds were exhumed after three months, at the time of sampling, 2% of seeds from both the populations were germinated at 0 cm, and no germination was observed from seeds buried at 2 and 10 cm depths. Seed decay varied from 42 to 81% across the depths. Under the laboratory environment, germination was low at 0 cm (19–21%) compared to 2 cm (58–67%) and 10 cm (54–57%) depths. The responses of this weed population under varying temperatures and light conditions are under examination. In addition, the effects of pH, osmotic potential, salinity, and depth of burial on the germination of this weed are being examined. The information gained in this study would lead to a better understanding of the germination and emergence of this weed in the NGR, thereby supplement the existing knowledge, and help to frame the appropriate weed management tactics.