

Biological Control of *Cirsium arvense* with the Use of *Puccinia punctiformis*

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Cirsium arvense, also known as California Thistle or Canada Thistle, has been found to be one of the most noxious weeds present in agricultural land across Canada and the United States (Skinner et al. 2000). Despite a wide range of biological control predators to this plant, most have proven to be ineffective in widespread use (Taru 2008). One such agent that deserves further research attention is that of *Puccinia punctiformis*, a rust fungus whose only known host has been found to be *Cirsium arvense* (Taru 2008). Infection of the fungus to the plant typically occurs systemically at sites of active root bud growth by means of rust teliospores (Frantzen 1994). A study was conducted in order to better understand the germination requirements of teliospores in hopes of finding optimal conditions for the use of *P. punctiformis* as a biological agent against *C. arvense*. It was found that these sites of active root bud development occur in temperature ranges between 5 C and 30 C (Frantzen 1994). The temperature effects on the germination of *P. punctiformis* teliospores were studied as well at temperatures of 5, 10, 15, and 20 C. Optimal rates of teliospore germination were determined to occur at the 10 and 15 C level, which fits in the temperature range of active root bud growth for *C. arvense* (Frantzen 1994). Results from this study may be utilized when considering the proper timing and application of *P. punctiformis* to maximize the chances of infection into the susceptible *C. arvense* host plant.