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GERMINATING SEEDS OF

Lesquerella

PERFORATA and *STONENSIS*

Substrate effects and mucilage production

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ABSTRACT

Seeds of the rare annuals *Lesquerella perforata* Rollins and *L. stonensis* Rollins (Brassicaceae) germinated to higher percentages on topsoil and filter paper than on masonry sand and play sand. In addition, mucilage production was consistently less on topsoil than on the 2 types of sands. An increase in mucilage thickness was correlated with a reduction in germination. Although mucilage production has been observed under laboratory conditions, it has not been observed in nature. We recommend germinating seeds of both *Lesquerella* species on topsoil or filter paper for best results.

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KEY WORDS

germination, *Paysonia perforata, Paysonia stonensis,* sand, substrate

NOMENCLATURE

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Spring Creek bladderpod (*Lesquerella perforata* Rollins [Brassicaceae]) and Stones River bladderpod (*L. stonensis* Rollins [Brassicaceae]) are endemic to Tennessee (Rollins and Shaw 1973). *Lesquerella perforata* occurs along Spring, Bartons, and Cedar creeks in Wilson County, and it is listed as Endangered by the US Fish and Wildlife Service and in Tennessee (Figure 1). *Lesquerella stonensis* is found on the East and West forks of Stones River in Rutherford County. This species was a candidate for federal listing; it is classified as Endangered in Tennessee (USFWS 1996, 1999; Shea 2001; Bailey 2004). Both species exhibit weedy tendencies by growing in pastures (Figure 2), agricultural fields, and along roadsides associated with flooding (Baskin and Baskin 1990; USFWS 1996; Shea 2001). Recently, the species were reassigned to the genus *Paysonia* (O'Kane and Al-Shehbaz 2002).

Each species is an obligate winter annual. At the time of dispersal, seeds are dormant and require a warm moist treatment to break dormancy (Baskin and Baskin 1990; USFWS 1996). During experiments conducted in 2003 on both species, the highest percentage of germination was only 29% following a warm moist treatment and incubation period at optimal temperatures. In contrast, seeds tested in 2002 germinated up to 100% for *L. perforata* and 65% for *L. stonensis.* Whereas the substrate used in 2002 was play sand, that in 2003 was masonry sand. Moreover, we observed that seeds in the 2003 experiment were covered with mucilage (Fitch 2004). Thus, we instigated an investigation into the effects of substrates and mucilage production on seed germination of both *Lesquerella* species. The purpose of the present paper is to alert propagators to potential problems in germinating seeds of *L. perforata* and *L. stonensis.*

MATERIALS AND METHODS

Fresh seeds of *L. perforata* were collected in Wilson County, Tennessee, and those of *L. stonensis* in Rutherford County, on 30 April 2003. Seeds of both species were given a warm, moist treatment for 18 wk and then incubated for 2 wk on commercial medium grade (masonry) sand (Quikrete® No. 1962), kept continuously moist, starting on 13 May 2003 (see Fitch 2004 for complete description of the treatment). Approximately 71 to 100% and 79 to 100% of the seeds of *L. perforata* and *L. stonensis*, respectively, remained non-germinated at the end of the 20-wk period. A subset of the seeds tested with tetrazolium (Grabe 1970) showed them to be viable.

Figure 1. The annual *Lesquerella perforata* in bloom. Photo by Jeffrey L Walck