

We are unable to supply this entire article because the publisher requires payment of a copyright fee. You may be able to obtain a copy from your local library, or from various commercial document delivery services.

From Forest Nursery Notes, Winter 2012

**45. © Germination of two seed types from three *Dalea* species.** Molano-Flores, B., Coons, J. M., and Cunningham, J. B. *Castanea* 76(3):266-271. 2011.

## Germination of Two Seed Types from Three *Dalea* Species

Author(s) :Brenda Molano-Flores, Janice M. Coons, and Jason B. Cunningham

Source: *Castanea*, 76(3):266-271. 2011.

Published By: Southern Appalachian Botanical Society

DOI:

URL: <http://www.bioone.org/doi/full/10.2179/10-050.1>

---

BioOne ([www.bioone.org](http://www.bioone.org)) is a nonprofit, online aggregation of core research in the biological, ecological, and environmental sciences. BioOne provides a sustainable online platform for over 170 journals and books published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Web site, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/page/terms\\_of\\_use](http://www.bioone.org/page/terms_of_use).

Usage of BioOne content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

# Germination of Two Seed Types from Three *Dalea* Species

Brenda Molano-Flores,<sup>1</sup> Janice M. Coons,<sup>2\*</sup> and Jason B. Cunningham<sup>2</sup>

<sup>1</sup>Illinois Natural History Survey, Champaign, Illinois 61820

<sup>2</sup>Department of Biological Sciences, Eastern Illinois University, Charleston, Illinois 61920

**ABSTRACT** *Dalea* species are legumes that often are included in seed mixtures used for prairie restorations. Three *Dalea* species (*D. foliosa*, *D. candida*, and *D. purpurea*) exhibit two different types of seeds: plump (well-rounded larger) and dented (wrinkled smaller) seeds. Differences in germination and viability of these two types of seeds have not been reported. Our objectives were to compare seed mass, germination and viability between these types of seeds for three Illinois *Dalea* species. Fruits were collected for *D. foliosa* from 1998–2001 (Will County) and for *D. candida* and *D. purpurea* from 2001–2003 (Kankakee, Tazewell and Will Counties). For each species, seed mass, germination and viability were determined per seed type (plump or dented). Seed mass was significantly higher for plump than dented seeds for all three species. For *D. foliosa* and *D. candida*, germination of dented seed exceeded that of plump seed in some years. For *D. purpurea*, germination was significantly greater for plump seeds in both years. For ungerminated seeds of *D. foliosa*, only the plump seeds were viable, whereas for *D. candida* and *D. purpurea*, both seed types were viable. A comparison of seed germination among all three species when collected in the same county and year showed lower germination for *D. foliosa* than for *D. candida* and *D. purpurea*. In summary, seed types play a significant role in germination of these three species, and *D. foliosa* has lower germination than *D. candida* or *D. purpurea*.

**INTRODUCTION** Legumes are important species in seed mixtures used for prairie restoration due to their role in nitrogen fixation in prairie soils and because they also can serve as a food source for both wildlife and livestock (McGraw et al. 2003, Fischbach et al. 2006). Among legumes commonly included in seed mixtures are two widespread North America species of clover, *Dalea candida* (Michx.) Willd. and *Dalea purpurea* Vent, but they are slow to establish. A third species, *Dalea foliosa* (Gray) Barneby, is federally endangered and restricted to dolomite habitat restorations within its United States range in Tennessee, Alabama and disjunct population in Illinois (Molano-Flores 2004). To maximize establishment of these *Dalea* species, a better understanding of their seed development and germination is needed.

Molano-Flores (2001, 2004) observed two different types of seeds in the federally

endangered species *Dalea foliosa* including well-rounded larger seeds and wrinkled smaller seeds. In a multiple year study for *D. foliosa*, fruit set (one seed per fruit) ranged from 80% to 95%, and 70% to 88% of the seeds produced were well-rounded larger seeds (Molano-Flores 2004). These two different types of seeds also were observed in *Dalea candida* (Molano-Flores and Coons, pers. obs.) and in *Dalea purpurea* (Hendrix 1994, Cane 2006). Although seed germination data exist for these species, seed germination studies (Baskin and Baskin 1998b, McGraw et al. 2003, Fischbach et al. 2006) have not mentioned these two types of seeds. Seed germination for *Dalea* species has focused on the well-rounded larger seeds as it is probable that the wrinkled smaller seeds were perceived as aborted seeds. The differences in seed size and form of these *Dalea* species also could be the result of environmental stressors (i.e., temperature and moisture) where plant resource allocations could affect seed quality

\*email address: jcoons@eiu.edu

Received December 20, 2010; Accepted May 6, 2011.