

# Moisture sorption characteristics of seeds of five ornamental species

Roel C. Rabara<sup>1\*</sup>, Miller B. McDonald<sup>1</sup>, David Tay<sup>2</sup> and Yael Vodovotz<sup>3</sup>

<sup>1</sup>Dept of Horticulture and Crop Science, <sup>2</sup>Ornamental Plant Germplasm Center and <sup>3</sup>Dept. of Food Science and Technology, Ohio state University, Columbus, Ohio 43210

## Abstract

Conservation of genetic resources of wild flowers is a challenging task because of limited information available. In seed genebank, the two important factors that could affect the longevity of stored seeds are the seed moisture content and temperature. The importance of these factors made it essential to understand the interaction among storage parameters in order to develop optimal seed storage protocols. In this study, the moisture sorption characteristics of 4 priority and 1 minor genera of Ornamental Plant Germplasm Center were evaluated. Moisture sorption isotherms was done on seeds of *Aster ptarmicoides*, *Impatiens wallerana*, *Lupinus texensis*, *Salvia splendens*, *Tagetes patula* and *Lactuca sativa* (control crop) using 7 different salt solutions with relative humidity (RH) ranging between 7 to 96%. Seeds were stored at 5, 15, 25 and 35°C until they achieved the equilibrium and the seed moisture content (MC) were determined by air-oven method. Moisture sorption isotherm curves were constructed and showed that seed MC increase with increasing RH in all temperature regimes. Rate of water loss in each species was done on imbibed seeds and stored in RH-controlled cabinet set at 10%RH. Seed weight loss during desorption was constantly recorded until the seeds achieved the equilibrium MC. The MC of imbibed *A. ptarmicoides* (37%), *I. wallerana* (37%), *L. texensis* (13%), *S. splendens* (44%) and *T. patula* (26%) equilibrated to 4, 3, 5, 4 and 4%, respectively during storage. Weight loss during desorption accounted between 9 to 40% of the original seed weight until equilibrium was reached during storage. Rapid weight loss occurred between 4-12 hours of storage in the cabinet with weight loss ranged between 6-32%. This study showed that seed MC of five ornamental species is influenced by RH and temperature of the storage environment.