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## Temperature and time variables for accelerated ageing testing of *Leymus chinensis* seed

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**Key words** : accelerated aging, germination percentage, *Leymus chinensis*, seed

**Introduction** Accelerated ageing (AA) is a test widely used to evaluate seed vigor in various species and exposes seeds for short periods to the two environmental variables which cause rapid seed deterioration, high temperature and high relative air humidity (Delouche and Baskin, 1973; TeKrony, 1993). Temperature and time regimes for standardized accelerated ageing tests using the inner chamber method have been published for several crop species (Hampton and TeKrony, 1995). *Leymus chinensis* (Trin.) Tzvel, a perennial rhizomatous grass, adapts to the cool and semi-humid climate of the grasslands of China (Gu et al., 2005). Specific AA test parameters for *L. chinensis* have not been established.

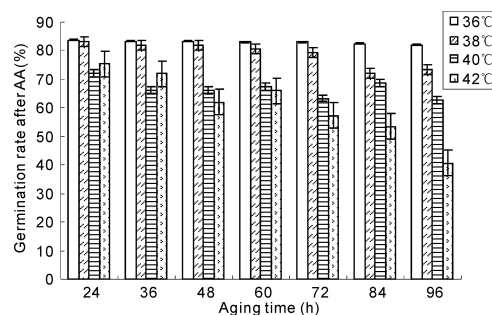
**Materials and methods** Seeds of *L. chinensis* with a germination of 80% and a moisture content of 7.8% were adjusted to a moisture content between 10% and 14% according to the Annex to Chapter 15 of the International Rules for Seed Testing (ISTA, 2005). AA tests were conducted using the inner chamber method (TeKrony, 1993). The ageing chambers (12 × 12 × 50 cm) were prepared by adding 50 ml distilled water and placing a single seed layer on top of a screened frame within each chamber. Seeds were aged at four temperatures (36, 38, 40 and 42°C). At each temperature ageing chambers were removed after 24, 36, 48, 60, 72, 84 and 96 hours (±15min). Germination was tested with an alternating 8 hour (h) light period at 30°C and a 16 h dark period at 20°C. Normal seedlings were counted after 6 d and 20 d following incubation, with the percentage of normal seedlings determined as described in ISTA Rules (2005). Analysis of Variance (ANOVA) was performed using SPSS for Windows™ 11.0.

**Results and discussion** The germination percentage after AA decreased significantly with increased ageing time or increased temperature (Table 1). The interaction of different ageing times and temperatures also significantly influenced the germination after AA ( $P < 0.01$ ) (Figure 1). Significant differences among seed germination after AA with the following combinations of temperature and time: germination 57%, 53% and 41% at 42°C with 72h, 84h and 96h respectively (Figure 1), indicates that these treatments could accelerate the *L. chinensis* seed artificial ageing.

**Table 1** Germination at different times or temperatures during accelerated ageing for *Leymus chinensis*.

Ageing time (h)	Mean germination after AA (%) <sup>†</sup>	Ageing temperature (°C)	Mean germination after AA (%) <sup>‡</sup>
24	79e	36	83d
36	76de	38	79c
48	73cd	40	67b
60	74cd	42	61a
72	71bc		
84	69b		
96	65a		

Column figures followed by the same letter do not differ at  $P < 0.05$ . <sup>†</sup> Mean germination value at different ageing temperature; <sup>‡</sup> Mean germination value at different ageing time



**Figure 1** Effect of combined ageing time and temperature on germination of *Leymus chinensis* seed.

**Conclusion** The combination of an ageing temperature of 42°C and an ageing time of 72 h is suitable for *L. chinensis* seed artificial ageing.

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