

Effects of depth and duration of burial on seed seasonal germination, dormancy and viability of 3 desert plant species

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Abstract

Dynamics of seed fate in the soil is very important for prediction of future plant community, land restoration and conservation. Present study investigated seasonal germination, dormancy and longevity of three desert plant species seeds which were subjected to different burial depth and duration in the field. Seeds of *Lespedeza potaninii*, *Nitraria tangutorum* and *Peganum multisectum* were buried at different depths (0, 2, 5 and 10 cm), and exhumed at bimonthly intervals from April 2008 to October 2009 in Alxa desert region, China. The exhumed seeds were classified as 'field germination', 'enforced dormancy', 'innate dormancy' and 'decayed seeds' (Harper, 1957). The results showed the field germination of 3 species increased with the buried depth rising. After 18 months burial, the maximum field germination of *L. potaninii*, *N. tangutorum* and *P. multisectum* are 15%, 26% and 12%, respectively. The innate dormancy percentage of *L. potaninii* seeds decreased from initial 98% to 64% on the soil surface (0 cm), but less change was observed when buried at 2 cm, 5 cm and 10 cm. Although a high level dormancy in *N. tangutorum* when seed were harvested, its innate dormancy percentage decreased from 94% to 1% after 4 months burial in the field. Contrary to above two species, *P. multisectum* seeds exhibited seasonal pattern (dormancy cycle) during experimental period. The maximum points of innate dormancy in two years were observed in October, and then decreased. The decayed seeds decreased with the buried depth rising, the maximum decayed seeds percentage of 3 species are 3.5%, 31% and 12%, respectively. These results indicated that the innate dormancy of 3 desert plant species decreased in different degree, but their field germination were all few, most of seeds lost innate dormancy were in an enforced dormancy state and it is an important strategy in the desert regions. The loss of seeds indicated that the 3 species all behaved as persistent soil seed bank according to Thompson's system (1979).

References

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