

Thousand-seed-weight and germination ability of native species used in grassland restoration in Hungary

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1. Introduction

There is a great need for seed traits data of sown species used for restoration of semi-natural grasslands, because in the lack of such data we cannot properly estimate the amount of seeds necessary for reintroduction. Several studies have shown that germination and establishment success increases with increasing seed mass, so the knowledge of correlation between these traits is also an important precondition for successful ecological restoration. In our restoration project we try to reconstruct a mosaic of open steppe oak forest and grasslands at the LEGO factory, near Nyíregyháza (Hungary) by means of sowing native seeds.



2. Aims

- to collect data on the seed weight, germination ability of sown species under laboratory conditions; on establishment data under field conditions at restoration site
- to analyse the connection between them

3. Material and methods

Subjects: seeds of 17 studied species were stored in dry circumstances and cleaned after collection.

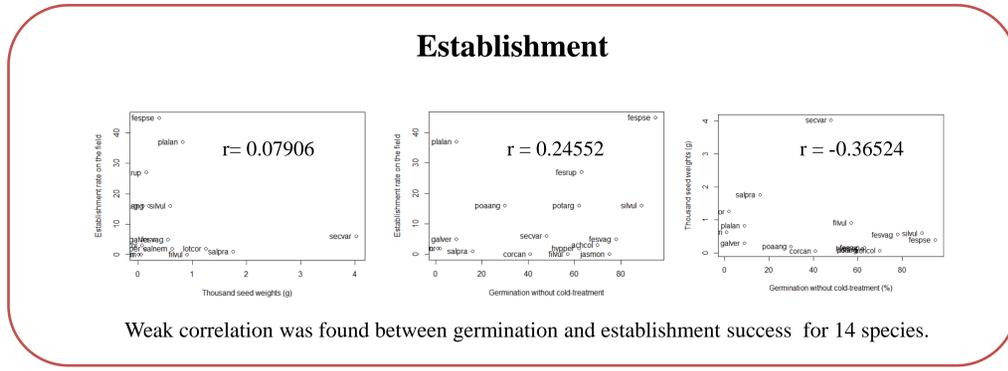
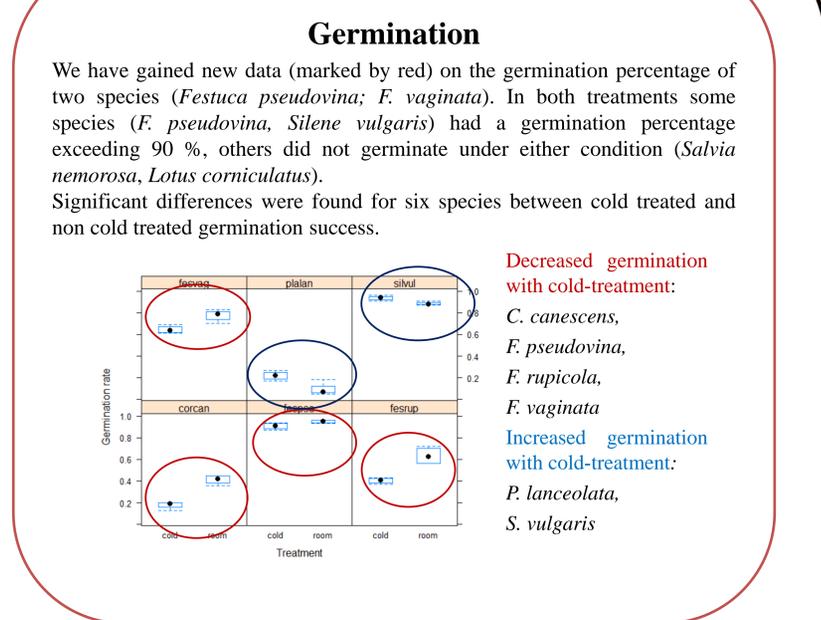
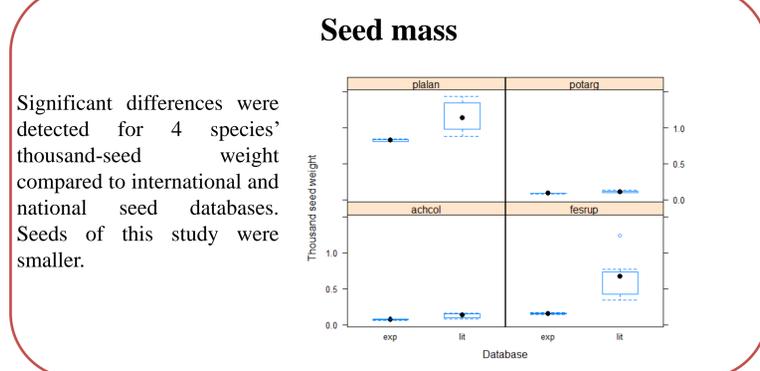
TSW (thousand-seed weight): 8 x 100 seeds / species were measured by analytical balance. TSW was compared by Mann-Whitney test to national and international databases (e.g. Liu et al. 2008; Török et al. 2013).

Germination ability: germination was tested in 4 replicates of 100 seeds in Petri dishes without and with a month-long cold treatment. Seeds were counted weekly for 4 months. Germination success was analysed by generalized linear mixed effects models (GLMM).

Establishment data: frequency of the 17 species were detected from 55 replicates of 2 x 2 m seeded plots at the restoration site in the second growing season (2016) after seeding.

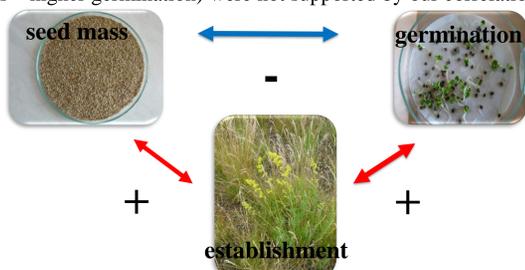
The **relationship** between seed mass, seed germination and field establishment was compared by Spearman correlation analysis.

4. Results



4. Conclusion

Our results complement the knowledge on seed traits, but there is still a lack of data on native species. Based on our data cold treatment is not a required procedure in restoration for the studied species, only poorly germinating seeds needed further studies. The results of previous studies (larger seeds – higher germination) were not supported by our correlation analysis.



The results are useful in nature conservation and can contribute to cost effective restoration planning and purchase of seeds.

References

- Liu, K., Eastwood, R. J., Flynn, S., Turner, R. M. & Stuppy, W. H. (2008): Seed Information Database (<http://www.kew.org/data/sid>).
- Török, P., Migléc, T., Valkó, O., Tóth, K., Kelemen, A., Albert, Á. J., Matus, G., Molnár, V.A., Ruprecht, E., Papp, L., Deák, B., Horváth, O., Takács, A., Hüse, B. & Tóthmérész, B. (2013). New thousand-seed weight records of the Pannonian flora and their application in analysing social behaviour types. *Acta Botanica Hungarica*, 55(3-4), 429-472.

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