Sement-APP: a decision support system to design sustainable Mediterranean grassland systems.

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Introduction. The sustainability of Mediterranean grassland systems implies that agronomic practices are carefully tailored to specific environmental conditions. Our hypothesis is that combining the available web resources and local data, it is possible to identify the most suitable species, varieties and agronomic techniques for designing sustainable Mediterranean grassland systems.

Materials and Methods. *Sement-APP* is an opensource app. The outputs are selected on the basis of the input informing a species/technique x input variable matrix. The matrix was generated on the basis of the available knowledge either obtained from seed company websites, scientific literature or expert knowledge.
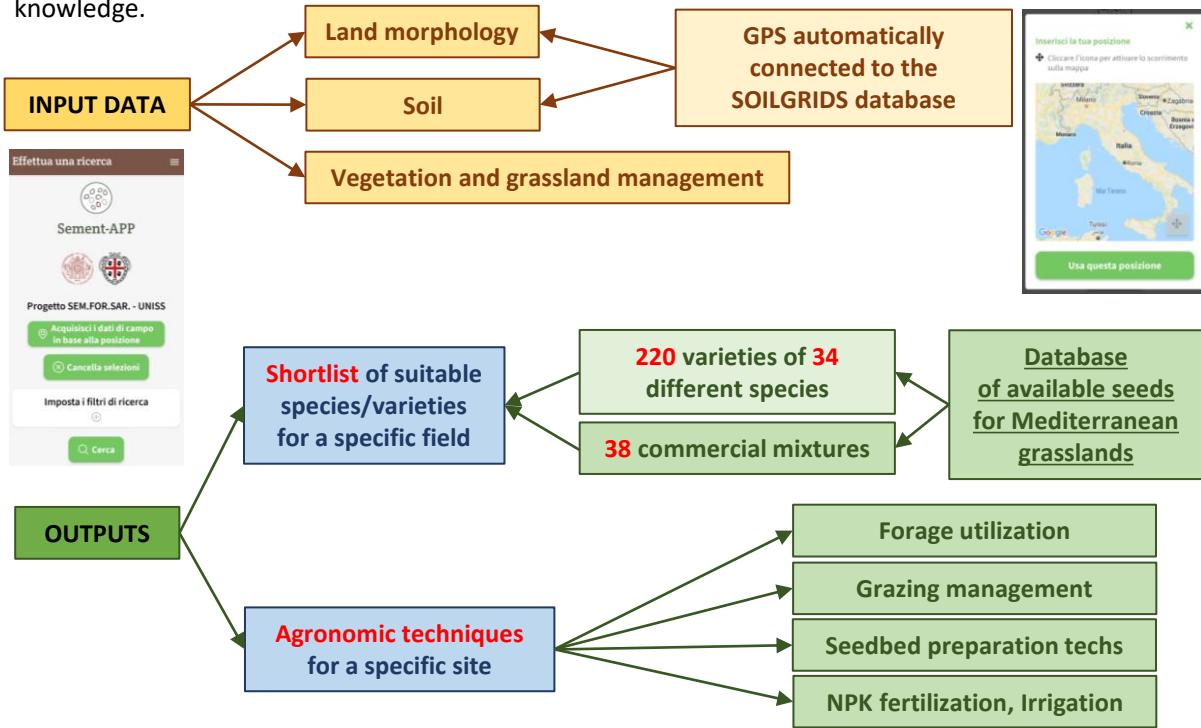
Results

Sement-APP was validated in Sardinia over 40 grassland fields under contrasting environmental conditions.

Most selected species:
- Only 23% of the varieties were chosen in at least 25% of the fields;
- Most of the seed available in the market is not suitable for Mediterranean grassland improvement;
- The most frequent species selected were self-reseeding legumes and summer-dormant cvs. of cocksfoot.

Agronomic techniques:
- The most frequent techniques shortlisted were rotational grazing, low N and medium P fertilization rates.
- Liming was suggested in 75% of the fields, due to the frequent occurrence of acid soils in Sardinia;
- Weed chopping and sod seeding were suggested in 75 % of the sites.

The main limitation of Sement-APP is that few experimetal data are available to test the adaptation of the different grassland species and varieties to Sardinian envirometal conditions. However, the outputs appeared to be consistent with the site-specific characteristics and what an expert agronomist would have suggested.

Conclusions
The first release of Sement-APP was able to provide a shortlist of adapted species and varieties and a set of agronomic practices that proved to be suitable for contrasting environmental conditions in Sardinia, thus generating site-specific decision support for grassland improvement. Sement-APP can be a useful tool for practitioners and farmers. The outcomes of the application evidenced that only a few species and varieties among those available in the seed market are suitable to be used for grassland improvement under the specific context of Sardinian grazing systems.