

Water-logging tolerance in *Lotus*

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Lotus tenuis (Lt) and *Lotus corniculatus* (Lc) are sown as forage legumes in the extensive area of natural grasslands called Flooding Pampa or Salado River Basin, in central-east Argentina. While the distribution area of Lc has remained restricted to the upper lands with better drainage conditions, Lt has become naturalized in most of the region and seems to be particularly adapted to the lowlands, where water logging events are frequent (Mazzanti et al, 1988; Miñon et al, 1990). A

Since 1989 we are carrying on studies on the water logging tolerance of Lt and Lc, trying to understand the role of this kind of environmental adversity in the population properties of both species. Complementary studies in this and other laboratories emphasize demography (Sevilla, 1989; Fernández et al, 1991) and animal utilization trends (Sciotti & Carrillo, 1991; Rosso & Chifflet, 1991) in pastures and natural grasslands, oversowing techniques (Colabelli & Miñon, 1991) and breeding (González García, 1991).

The results of experiments carried on at different moments of the year and with plants of different age and phenological phases have clearly shown that Lt is more tolerant to water logging than Lc. Lt could tolerate forty two days of constant water logging in winter-spring without important damage, while Lc showed in the same period chlorosis in leaves and shoots and root decomposition, with important losses of biomass. Summer logging severely affected both species, but after seventeen days of this treatment, mortality was almost total in Lc while only half of the Lt plants died.

The percentage of germination of the seeds of both species diminished with the time spent under water, but the period of time required for minimum germination was almost double in Lt than in Lc. This time period seems to be affected by the age of the seeds, at least in Lt; new hard seeds keep their viability for longer periods than old seeds under water logging conditions.

These results confirm the adaptation of Lt to the periodical water logging events in the Flooding Pampa. This physiological behaviour seems to be one of the ecological traits that support the important demographic expansion of this exotic species in this region of the pampean grassland, where environmental conditions are rather restrictive for other legumes.

Future research activities will focus on the existence variability for water logging tolerance in different populations *Lotus tenuis*, most of them collected in different localities and environments of the Flooding Pampa (Montes, 1980; Clausen & Alonso 1991). This information is of great interest for local breeding programmes in *Lotus tenuis*. -

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