

Effect of photoperiod and phosphorus nutrition on *Lotus tenuis* flowering

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The genus *Lotus* is widely distributed, being found within 26 and 58 ° of latitude in both hemispheres. Occurrence of *Lotus* in Argentinean grasslands is strongly influenced by temporal and spatial variation. Phosphorus availability is a major constrain for *Lotus* productivity and flowering particularly depends on latitude. The interactive effects of P nutrition and photoperiod have received scarce attention. Here we studied the combined effect of photoperiod and P availability on flowering time and flower production in *Lotus tenuis*. For this goal two *Lotus tenuis* cultivars, “Tresur Chajá” and “La Esmeralda”, were grown in a natracuol soil with or without the addition of 100 ppm P. Plants were grown at 8 (natural), 14 or 16 h photoperiod.

Results obtained unveil a strong influence of the genotype since flowering took place early for “La Esmeralda” than for “Tresur Chajá” regardless of the P level and the photoperiod. In turn, P-fertilization led to a reduction of the flowering time for both cultivars. Extended photoperiods led to early flowering and to increased number of flowers. Interestingly, anthesis in plants exposed to a 16 h photoperiod occurred in September (South hemisphere) while in those receiving a natural photoperiod it took place in December. Plants exposed to a 16h photoperiod displayed large internodes and small leaves with chlorosis symptoms.

It is concluded that *Lotus tenuis* is a long day plant. Optimal flower production requires a 16 h photoperiod but a 14 h photoperiod could be sufficient to ensure an adequate production of flowers. P nutrition positively affects flowering. Because *Lotus tenuis* is grown in the Flooding Pampa (Buenos Aires, Argentina) at the limits of the above mentioned photoperiods and that most soils in this zone are affected of low P availability, both factors are likely to constrain flower production under natural conditions thus limiting *Lotus tenuis* distribution. The existence of genotypic differences in the response to photoperiod suggests the suitability of *Lotus tenuis* breeding for improved photoperiodic response.