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Flooding effects on plant recovery from defoliation in the legume *Lotus tenuis* and the grass *Paspalum dilatatum*

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Flooding and grazing are major disturbances affecting plant performance in many grassland ecosystems. However, little is known about the effects of flooding on plant recovery from defoliation. We investigated this issue in two contrasting forage species: the grass *Paspalum dilatatum*, that regrowth primarily from current assimilation, and the legume *Lotus tenuis*, that alternatively regrowth from crown reserves. Plants of both species were subjected to defoliation (removing 60 % of shoot biomass) in combination with 15 days of flooding at 6 cm water depth. Plant responses for tissue porosity, height, shoot number and biomass of the different organs were assessed. Plant recovery from defoliation was evaluated over a 30 days post-flooding period under control conditions. In both species, flooding increased shoot and root porosity independently of plants had been or not defoliated. Flooding and defoliation interacted in reducing plant height of *P. dilatatum*, that registered 70% of their tillers under the water level, a higher proportion than plants growing under other treatments (17, 28 and 48% for flooded, control, and defoliated plants, respectively). Flooded × defoliated plants of *P. dilatatum* did not recover from the negative effect of the disturbance combination, achieving 32% lower biomass than the plants subjected to other treatments. By contrast, plant height of *L. tenuis* was not affected by the interactive effect of flooding and defoliation. Flooded × defoliated plants of *L. tenuis* registered a higher proportion of shoots emerging from water (72%) than the plants growing under other treatments (48, 53 and 58% for defoliated, flooded and control plants, respectively). In biomass terms, such plants attained full recovery with respect to either defoliated or flooded plants, showing a significant expense of crown biomass for plant refoliation processes. The results showed that the combination of flooding and defoliation clearly determined a trade-off in the growth of the grass *P. dilatatum*. This negative interaction was not detected in the legume *L. tenuis*, where the use of crown reserves seems to be a key factor to allow plant recovery from defoliation after flooding events.