
Establishing ecological strategies to limit the expansion of *Reynoutria japonica*: effects on vegetation and soil restorations

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Abstract

Reynoutria japonica is an invasive species in France whose exponential population dynamics cause environmental and economic problems. We have established an ecological strategy using competitive plant species and monthly mowing to limit the expansion of *Reynoutria* on urban areas. Since 2015, we tested different plant associations on 4 plots. Our objectives were (i) to study the effects of this strategy on *Reynoutria* growth with intra-annual measurements of functional traits (ii) to monitor the colonization of native and sown species and (iii) to follow the dynamics of soil fertility using microbial biomass and soluble carbon and nitrogen measurements. From May to July 2015, our strategy significantly decreased the height and the stem diameter of *Reynoutria*. After the second mowing, the leaf area also decreased indicating a potential carbon loss for *Reynoutria*. However, the stem density increased after the first mowing on 2 plots which showed a species acclimatisation. The majority of native plants are competitive species and the species richness increase between March and June 2015. Moreover, our first results demonstrate an increasing trend in species richness of march 2016 compared to that of 2015. For soil fertility, no significant intra-annual dynamics of microbial biomass was observed in 2015. However, there was an increase of soil soluble nitrogen which could be due to the weakening of *Reynoutria* which release available nitrogen for other species. Our results highlight a potential effectiveness of our ecological strategy to decrease the *Reynoutria* growth. The experiments should be pursue to try to eradicate the invasive plant.

Keywords: *Reynoutria japonica*, invasive species, ecological strategy, functional traits, soil fertility

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