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## Non-linear response of Mediterranean ecosystem to interaction of drought and plant invasion

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The impact of interacting global change stressors on terrestrial ecosystems is hard to predict due to non-linear, amplifying, neutral or even buffering interaction effects. We investigated the effects of drought and plant invasion on Mediterranean cork oak (*Quercus suber* L.) ecosystem functioning and recovery with a combined rain exclusion (30-45 % reduction) and shrub (*Cistus ladanifer* L.) invasion experiment. As key parameter, we determined tree, shrub and ecosystem transpiration in four treatments: 1) cork oak control stands, 2) cork oaks with rain exclusion, 3) cork oaks invaded by shrubs and 4) cork oaks with rain exclusion and shrub invasion. Rain exclusion and plant invasion led to moderate, but neutral reductions of tree transpiration of 18 % (compared to control) during the mild summer drought in 2018. In 2019, the rain exclusion simulated the second driest year since 1950 for Southwestern (SW) Iberia. The interaction effect of drought and plant invasion was strongly amplifying, reducing tree transpiration by 47 %. Legacy effects on shrubs under the rain exclusion treatment led to a non-linear response during recovery from the severe drought in 2019. Invaded trees showed a delayed transpiration recovery (-51 % vs. control) due to strong competition with shrubs, while invaded trees with rain exclusion recovered to 75 % of the control. This buffering interaction response was caused by a weaker competition from drought-stressed shrubs. Given the projected increase in the frequency, intensity and duration of drought, an increasing non-linear impact on Mediterranean cork oak ecosystems is expected. Our results demonstrate that abiotic stressors modulate biotic interactions thereby impacting ecosystem functioning in a highly dynamic manner. Further efforts are thus needed to model and manage the impact of interacting global change stressors on terrestrial ecosystems.