Background: Seed mass is a life history trait that is related to invasiveness. Under limiting conditions, a trade-off is observed whereby an increase in seed mass occurs at the expense of seed numbers; if the above trade-off holds across climatic gradients it can provide an opportunity to assess the fitness/invasive potential of exotic plants.

Aims: To examine the variation in the life history traits of *Eschscholzia californica* populations across climatic gradients and to relate these traits to observed invasiveness.

Methods: We examined 19 populations in Chile. For each population we related seed mass, seed number, the slope of trade-off between seed mass and number and plant density with annual precipitation and mean annual temperature.

Results: Seed number and the coefficient of variation in seed mass were positively correlated with climatic variables. Trade-off was detected in 26% of the populations and no relationship was detected with climatic gradient. Plant density was negatively associated with precipitation.

Conclusions: The results suggest that for *E. californica* producing seeds with a variety of sizes is an optimal strategy to face geographic heterogeneity and hence to increase its invasiveness. Increased production of seeds at the cool and wet southern limit of the current range of the species does not contribute to an increase in its invasiveness.