



Supplementary Figure S1. Experimental setup in 2011 and 2013. The S group and NS group were kept on separate parcels, with and without access to a fenced shade area, respectively. To exclude effects of allotment on the response variables, the experimental groups and the passage to the shaded area alternated regularly between allotments (daily for dairy cows, weekly for beef cows and calves). The shaded area consisted of a part of the pasture (25m*25m for dairy cattle, two connected pieces of 15m*30m for beef cattle) with evenly spaced (5m) young willow (*Salix alba*), poplar (*Populus alba*) and alder (*Alnus glutinosa*) trees and shade cloth (shading percentage = 80%) spanned between them.