Background: Positive plant–plant interactions similar to specialised plant growth forms are potential strategies to overcome the environmental harshness of Afro-alpine ecosystems. However, knowledge about plant–plant interactions is limited for African alpine regions. Aims: We investigated the ameliorative effect of the densely leaved dwarf shrub Helichrysum citrispinum on two frequently co-occurring herbaceous plant species in the alpine zone of Mt. Kilimanjaro. Methods: We recorded microclimatic conditions, plant water potentials and gross primary production (GPP) for plants of the low-growing perennial Alchemilla johnstonii and the tussock grass Festuca abyssinica and compared these parameters between open sites and under H. citrispinum shrubs between July and August 2012. Results: Shrubs significantly buffered daily variation and extreme values of irradiation, air-, plant surface- and soiltemperatures as well as vapour pressure deficit. We found enhanced plant water potentials and gross primary production for shaded plants of both species investigated; ameliorative effects were higher for A. johnstonii than for F. abyssinica. Conclusions: Habitat amelioration of H. citrispinum significantly improves the productivity of plant species that grow under the shrub, although the net outcome may be affected by interspecific growth form differences. Future studies on positive plant–plant interactions should more strongly focus on the ecophysiological consequences of habitat amelioration.