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Growth of alpine grassland will start and stop earlier under climate warming

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Alpine plants have evolved a tight seasonal cycle of growth and senescence to cope with a short growing season. The potential growing season length (GSL) is increasing because of climate warming, possibly prolonging plant growth above- and belowground. We tested whether growth dynamics in typical alpine grassland are altered when the natural GSL (2-3 months) is experimentally advanced and thus, prolonged by 2-4 months. Additional summer months did not extend the growing period, as canopy browning started 34-41 days after the start of the season, even when GSL was more than doubled. Less than 10% of roots were produced during the added months, suggesting that root growth was as conservative as leaf growth. Few species showed a weak second greening under prolonged GSL, but not the dominant sedge. A longer growing season under future climate may therefore not extend growth in this widespread alpine community, but will foster species that follow a less strict phenology.

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