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Localization of soil depth for N uptake by *Kobresia* roots in Tibetan grassland

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The Tibetan Plateau provides the world's largest alpine ecosystem and is dominated by *Kobresia* grasslands, which cover ca. 450,000 km^2. *Kobresia* pastures are expected to be grazing-induced and are accompanied by sedge-turf varying in thickness between 5 - 30 cm. These pastoral root mat ecosystems are of global and regional importance due to its impact on global water, heat and carbon cycles, its high storage of carbon, nitrogen and other nutrients and its provision of important grazing areas, because they protect against mechanical degradation and provide a fast regrowth after heavy grazing events.

Yet, less is known about the development and functioning of this *Kobresia* root mats. We investigated the nitrogen uptake from different soil depths mainly consisting on *Kobresia* root mats and N mobilisation into the soil-plant-system by localized ^{15}N additions. A ^{15}N pulse labeling experiment was set up in July 2012 during the vegetation period on sites of the KEMA research station (Kobresia Ecosystem Monitoring Area) near the city Nagqu. ^{15}N urea was injected into six soil depths: 0-1 cm, 1-5 cm, 5-10 cm, 10-15 cm, 15-20 cm, 20-25 cm. Samples of soil, root and shoots were taken 45 days after the ^{15}N labeling. Detailed description of soil profiles were carried out considering basic characteristics of single horizons.

Due to low atmospheric N depositions and high N immobilization in the root mats, the study site is limited by plant available N. Hence, N uptake efficiency is assumed to be generally high and thus highest ^{15}N amounts should be recovered in above- and belowground plant biomass. Moreover, by linking information of localization of N uptake and the morphological description of *Kobresia*-turf profiles, the functional purpose of single horizons can be obtained, which help to understand its successful establishment, functions and future trends with regard to change of climate and management.