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Toward a Decision Support System for the Management of Grasslands and Pastures under Climate Change

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During the past two decades, grassland production in Switzerland has been threatened by extreme events many times, pushing the authorities to intervene in support of farmers on several occasions, lastly in 2015 in the wake of a severe drought period. This has reinforced the concerns about the possible implications of global warming for climate variability and eventually its impacts on grassland and pastoral systems. It has further promoted targeted research and outreach activities aiming at exploring possibilities for adaptation. In this context, a growing interest for operational tools that can support management decisions and deliver short- to medium-term forecasts has been signalized from various sides. Such tools are currently not available in Switzerland.

In this contribution, we report on ongoing efforts to develop an operational monitoring and prediction platform. At the core of the decision support system is a model of herbage growth and quality that can address different types of production systems, from intensively managed grasslands to extensive pastures, with a minimum of inputs. Various aspects related to the development, verification and operational implementation of the tool will be examined, including: the need for data and better approaches in relation to the simulation of grassland phenology, in particular spring phenology; the need for a reliable representation of grassland responses to seasonal drought, including changes in composition; the need for continuous data that can be assimilated to adjust the simulations during a prediction cycle; the need for representing and communicating uncertainties. Examples from recent research and monitoring activities will be used in turn to discuss the various issues.