Summary

The development of agronomic simulation models allows to simulate crop production under different climate, soil, and management conditions. The objective of this study was to calibrate and validate the Decision Support System for Agrotechnology Transfer (DSSAT) for simulating the growth of the perennial tropical forage grass *Brachiaria decumbens* cv. Basilisk. The existing CROPGRO model, which is part of DSSAT, was used for *B. decumbens* without making any modifications to the structure of the model; only input parameters that define a crop species, cultivar, and ecotype were changed. Lacking an option for grass grazing or cutting in DSSAT, the effect of partial shoot removal was simulated with the insect pest option. Earlier the subtropical Bahia grass was included in CROPGRO in a similar way. An extensive literature search and some additional field study provided the information for estimating the input parameters needed. The fine-tuning of these parameters to calibrate the model for *B. decumbens* was done with four data sets from different sites in Colombia that were part of the International Network for the Evaluation of Tropical Pastures (RIEPT: Red Internacional de Evaluación de Pastos Tropicales). The new model option was then validated with two additional data sets from other sites in the RIEPT network. Validation showed that the simulated dry-matter production of the pasture with cutting intervals of 3, 6, 9, or 12 weeks, was on average between 96% and 101% of the observed values for one of the validation experiments, and between 82% and 100% for the other. However, excluding the data from the first cutting at the latter site, which relates to pasture establishment during a period of drought stress when the observed dry-matter production stayed far behind the simulated production, would result in a tight validation range of 98%-101% for this experiment also.

It is concluded that the new model option accurately estimates the pasture production of *B. decumbens* cv. Basilisk with grass-cutting management under different soil and climate conditions. Further calibration for higher-latitude sites may be needed for obtaining a more general validity for the area where this species is commonly grown. The study has demonstrated that DSSAT can be developed as a decision support tool for management of *B. decumbens* pastures, provided that the model is calibrated under conditions of grazing.