

Title Modeling the impact of traceability on harvesting and transport operations of rice crops
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Abstract

The harvest and transport operation is composed of a system of machines working together. As a result of this interaction, the field efficiency of the combine could be limited by the capacity of the transportation system. Moreover, traceability may require special handling of the grain in order to keep the production segregated into smaller lot sizes, and this could increase the impact on the transportation system and the related costs. With the aim to evaluate field traceability in comparison to cultivar traceability, the authors built a discrete event model to simulate the harvesting and transportation chain, and evaluate its technical, logistic and economic aspects. The model predicts the performance of the entire harvesting chain, taking into account the pattern of the combine in the field and the logistics of the transportation system. The harvest pattern of each single field was simulated as a series of linear segments. In this way the shape and the field conditions could be represented very well in the model. The model simulates an entire farm harvesting operation, field by field. The costs for harvest operations are raised by 6% for field traceability compared cultivar traceability. The rise in cost is mainly due to the transport operations that increase as the field distance increases.