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### A Model for Phenological Development of Vietnamese Rice Influenced by Transplanting Shock

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**Abstract:** Phasic development of rice is influenced by various climatic conditions and the nursery duration. As a step toward the analysis of yield potential and yield loss in the Red River Delta, Vietnam, we conducted field trials with different nursery durations and transplanting times to develop a model for estimating heading times of a non-photosensitive cultivar CR203 in the Red River Delta. Days from seedling emergence to heading varied from 73 to 106 d, the rainy season crops having a shorter duration than the winter-spring season crops. The heading time could generally be estimated by the function of air temperature, but the delay in heading due to transplanting (transplanting shock), defined as the difference in the days from emergence to heading between transplanted and direct-seeded rice, ranged from 1 to 9 d and caused a substantial error in the heading time estimation. This variation in the delay of heading was explained as a function of the seedling age at the transplanting time. The model considering the transplanting shock estimated the heading dates in the independent data sets obtained at fields of local farmers with root mean square deviation (RMSD) of 2.15, while the model not considering the transplanting shock estimated those with a RMSD of 3.34. We conclude that this simple transplanting shock model was applicable for estimating the rice phasic development in the Red River Delta.

**Keywords:** [Development](#), [Growth delay](#), [Model](#), [Red River Delta](#), [Rice](#), [Transplanting](#), [Transplanting shock](#)

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