

[P2] Farming System

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 2 (Poster) (Farming System)

1:15 PM - 2:00 PM

[P2-16]Evaluation of the Differences in Yield Response to Organic Fertilizer between Two Soybean High-Yielding Lines 'Toiku 273' and 'Tokei1335' by Hierarchical Bayesian Model

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The purpose of this study is to evaluate the differences in yield response between the two high-yielding lines, 'Toiku 273' and 'Tokei 1335', observed in our previous study. Organic fertilizer under narrow row condition increased the yield of Toiku 273 but did not that of Tokei 1335 (Nagasaki et al. 2020, 249th CSSJ meeting). Here we compared the response to yield components with the same hierarchical Bayesian model as in the previous study, which is very flexible to estimate the effect of each type of treatment on each line.

Field experiments were conducted at Hokkaido Agricultural Research Center with four treatments: standard rows (66 cm), narrow rows (33 cm), densely planted narrow rows, and organic fertilizer under the narrow rows. Both fixed and random effects of 100-seed weight and fertile pod number were estimated. To estimate the posterior distribution of the parameters, the Markov chain Monte Carlo method was implemented using "Stan."

In the narrow row condition, the fertile pod number of Toiku 273 was larger than that of Tokei 1335; conversely, the 100-seed weight was smaller. The application of organic fertilizer increased the 100-seed weight of both lines. However, its effect on fertile pod number was unclear for both lines. These results suggest that organic fertilizer under narrow row condition was mainly effective during seed filling. This indicates that the highest yield in this experiment (Toiku 273 with organic fertilizer under the narrow row) is attributed to the larger sink size and enhanced source amount by organic fertilizer.