

AUTOMATIC SECTION CONTROL FOR PLANTERS: AN ADVANCED TECHNOLOGY TO BENEFITS CORN AND SOYBEAN YIELDS

¹G. M. Corassa, ²T. Amado, ¹R. Schwalbert, ²T. Liska, ³A. Sharda, ⁴J. Fulton, ³I. Ciampitti

1. Federal University of Santa Maria / Kansas State University

2. Federal University of Santa Maria

3. Kansas State University

4. The Ohio State University

Due to high production costs, farmers are exploring new technologies to fine-tune the use of different inputs. Under this scenario, Automatic Section Control (ASC) technology has gained interest and becoming a standard technology for different agricultural implements. For planters, ASC (by controlling row) is a strategy to avoid double-planted area (DPA) on end rows which is a common issue on corn (*Zea mays* L.) and soybean (*Glycine max* L.) fields. Reducing DPA produces seed cost savings, but could also play a role in crop yields, affecting economic profits. However, the effects of DPA on corn and soybean yield is still a knowledge gap. In addition, the DPA proportion within Brazilian fields was not yet quantified. Thus, two datasets were used in this study: the first one (dataset I), based on on-farm trials, was used with the goal of i) quantify the effects of DPA compared to ASC on corn and soybean yields, and ii) to estimate the planted area necessary to recover the investment of the ASC. The dataset II was used to iii) quantify the DPA proportion in Brazilian fields. For this approach, we used geo-referenced planting data (shapefiles) collected from farmer fields. The main findings from this study were: i) corn yield was more proportionally reduced for DPA as yield level decreased. The average yield reduction for corn from DPA was 8.5% and was primarily related to the reduction in grains number per ear. Soybean yield presented similar behavior for both DPA and ASC, due to compensation between the seed number per plant and number of plants per unit area; ii) the return of investment for the ASC is recovered with lower planted area when corn is the main crop; iii) average DPA proportion was 5.5% of the total area, but for irregular fields, DPA increased faster as planted area rose. Overall, the findings from this study support the adoption of ASC for planters as a new precision agriculture tool. Currently, the ASC is becoming a standard technology for new planters worldwide, with the projected cost decreasing as the adoption rate is increasing. Finally, we suggest that future research should be conducted on different crops and yield environments.

G. M. Corassa T. Amado R. Schwalbert T. Liska A. Sharda J. Fulton I. Ciampitti On Farm Experimentation with Site-Specific Technologies Oral 2018