**ML 2018 Project Abstract**
For the Period Ending June 30, 2023

**PROJECT TITLE:** Confronting soybean aphid with advanced plant breeding and remote sensing
**PROJECT MANAGER:** Robert Koch
**AFFILIATION:** Entomology, College of Food, Agriculture, and Natural Resource Sciences
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**WEBSITE:** https://mitppc.umn.edu/research/research-projects/decreasing-environmental-impacts-soybean-aphid-management
**FUNDING SOURCE:** Environment and Natural Resources Trust Fund
**LEGAL CITATION:** ML 2018, Ch 214, Art 4, Sec 2, Subd 6a

**APPROPRIATION AMOUNT:** $292,492
**AMOUNT SPENT:** $292,492
**AMOUNT REMAINING:** $0

## Sound bite of Project Outcomes and Results
This research advanced the availability of aphid-resistant soybean lines for more effective and durable control of soybean aphids without insecticides.  Additionally, a tool was built to use satellite data to accurately determine if aphid infestations in soybean fields are great enough to require insecticide application to protect yield.

## Overall Project Outcome and Results
Over the course of both project phases, Koch's team successfully developed multiple aphid-resistant varieties. They advanced the breeding pipeline, increasing the number of lines with multiple aphid resistance genes. Overall this effort will result in more effective aphid control without the need for insecticides..
The team also advanced the ability to use remote sensing (drones and satellites) to detect soybean aphid. They built hardware to host new algorithms for autopilots, and they were able to build a model to use actual satellite data to accurately determine if aphid infestations in soybean fields are great enough to require insecticides to protect yield. The project also led to the detection of a new soybean pest, *Macrosaccus morrisella*. Outcomes from this project help farmers prevent soybean aphid outbreaks through the use of aphid-resistant soybean lines. It also enables effective remote scouting for aphid infestations, which could significantly decrease the unnecessary use of insecticides.

## Project Results Use and Dissemination
Two peer reviewed publications have derived from this research project. All peer reviewed publications are permanently underlined.  Multiple public presentations were made through the UMN Extension program, as  well as industry events, and academic conferences. A full listing may be found on the MITPPC  webpage dedicated to this research project.

Invention disclosure
M13-266011 and M13-262053 (OTC Case No. 2023-237). 2023. Two aphid-resistant soybean varieties with superior quality and suitable agronomics.