

A new approach to managing white mold in MN soybean

Principal Investigator: Angie Peltier & Cooperator: Dean Malvick

Email: apeltier@umn.edu

Phone: 218-281-8692

White mold (WM) is an economically important soybean disease caused by a fungus called *Sclerotinia sclerotiorum*. Many of the production practices that have been adopted to maximize soybean yield potential favor a dense canopy and therefore also favor WM and yield loss. Significant yield losses can occur even when fungicides are timed perfectly, likely due to inadequate canopy penetration and coverage.

In 2020, researchers used steel tubing and plumbing parts to build within-the-canopy (WTC), between-the-rows spray booms (**Figure 1**) to ride between 22 and 30 inch soybean rows. Each WTC unit has three flat fan nozzles, two oriented vertically toward rows and one upward at a 45° angle. Keeping speed, volume and pressure constant, coverage and efficacy of fungicide applied using this spray boom was compared to fungicide applied using a typical, over-the-top (OTT) spray boom. Note that while fungicides coverage is maximized when droplets are small, some labels suggest larger droplets for WM management for sufficient canopy penetration; medium and very course droplets were therefore applied for WTC and OTC applications, respectively.

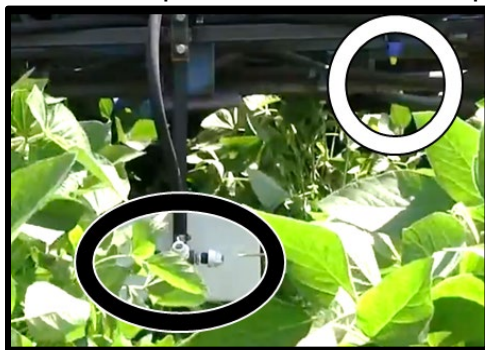


Figure 1. Configuration of the tractor-mounted hydraulic-powered plot sprayer used to apply fungicide in this experiment. The WTC nozzle body (black circle) rode approximately 12 inches above the soil surface and OTT nozzles (white circle) rode approximately 8 inches above the soybean canopy.

To collect fungicide coverage data, water sensitive paper was placed 6 and 12 inches above the soil line within rows. When plants reached beginning to full flowering, 8 oz/A of Endura was applied either OTT or WTC. Plots were then infested with the WM fungus, and plots irrigated to improve the chance of WM developing. Software was used to estimate spray coverage. Disease incidence, soybean yield and moisture data were also collected. The WTC application resulted in significantly better fungicide coverage than the OTT application 6 inches above the soil line in 22, but not 30 inch rows, with similar trends observed 12 inches above the soil line (**Figure 2**). While 2020 was important from a “proof of concept” standpoint, warm temperatures meant that disease never developed and so we were unable to observe differences among treatments for disease incidence and soybean yield. Similar MSRPC-funded research will take place in 2021.

Figure 2. Water sensitive paper that had been placed in rows 6 inches above the soil line before fungicide was applied using either the traditional OTT method (left) or the experimental WTC method (right).

