**Title:** Effects of Heads Up + Base vs. Base Seed Treatment on SDS Root Rot, Foliar Symptoms, and Yield in Soybeans

**Purpose:** Compare the effects of the biological seed treatment, Heads Up, with a base seed treatment on soybean yield using 4 soybean cultivars at 10 locations. Fusarium root rot and SDS foliar symptom ratings will also be collected to compare Heads Up and base seed treatment effects. White mold ratings will also be collected at R5-R6.

**Locations:** Decatur, East Lansing (PLP), and Montcalm Research Center; MSU soybean variety trial sites (Allegan, St. Joseph, Hillsdale, Ingham, Lenawee, Saginaw, & Sanilac Counties)

**Experimental design:** RCBD with 4 replications

**Varieties:** GH2292E3, P28A65E, DF3191NE3, DF3211NE3

**Planting Population:** Decatur & PLP = 140,000 seeds/acre; all others = 160,000 seeds/acre

**Treatment list:**

1. GH2292E3 + base (Cruiser Maxx APX + NForce)
2. GH2292E3 + base + Heads Up
3. P28A65E + base (LumiGen)
4. P28A65E + base + Heads Up
5. DF3211NE3 + base (DFender)
6. DF3211NE3 + base + Heads Up
7. DF3191NE3 + base (DFender)
8. DF3191NE3 + base + Heads Up

**Assessments:**

**Stand counts at V2**:

Assess canopy cover using Canopeo

Count live plants in the middle two rows (harvest rows). Convert the number per plot to plants per acre while reporting

**SDS root rot ratings at V3**: (Decatur, PLP, & Montcalm only)

1. Dig 10 soybean roots very gently from the border rows of each plot at growth stage V3 using shovels. Make sure roots are not damaged while digging.
2. Record date of sampling and actual growth stage
3. Remove top of plant and place tap roots in labeled plastic bag and into cool box
4. Transport roots back to lab for processing
5. Gently wash soybean roots to remove all soil from the roots
6. Estimate root rot severity and record percent root based on a 1-5 scale
7. Dry, weigh, and store roots

**Foliar SDS ratings at R1-R6:**

Assess SDS foliar symptoms starting at R1 through R6 in the two middle rows. Estimate disease severity using SIU’s rating scale (below). Estimate incidence on a plot level as well. If possible/applicable, SDS rating should be collected multiple times at least one week apart and should be determined on SDS severity.

**SIU’s SDS Rating Scale for Disease Severity (DS)** [record in increments of 0.5 at the most]

**Score Description of Symptoms**

**1** 1-10% of leaf surface chlorotic, OR 1-5% necrotic

**2**  10-20% of leaf surface chlorotic, OR 6-10% necrotic

**3**  20-40% of leaf surface chlorotic, OR 11-20% necrotic

**4** 40-60% of leaf surface chlorotic, OR 21-40% necrotic

**5** >60% of leaf surface chlorotic, OR greater than 40% necrotic

**6** Premature leaf-drop up to 1/3 defoliation

**7** Premature leaf-drop up to 2/3 defoliation

**8**  Premature leaf-drop GREATER than 2/3 defoliation

**9**  Premature death

Monitor disease and note foliar incidence/severity gross severity rating (low, medium, high – 1 rating per site) at R5-R6 (report this estimate to Mike Staton)

**White Mold ratings at R5-R6:**

Assess White Mold disease severity (0-3 scale) at R5-R6, but before beginning of senescence. (Montcalm & PLP only)

**Yield:**

Harvest middle rows of each plot at maturity. Convert plot yield to Bu/A while reporting

Note any pod shattering that may occur during harvest; particularly in early-maturing varieties (if applicable). SDS-induced dry down may affect this.