Final Report: 2018 NW Minnesota Soybean Research and Tech Transfer
Phillip Glogoza, Angie Peltier and Jared Goplen, Univ. of Minnesota Extension

Abbreviated Proposal Objective and Goal Statements:

1) Soybean Cyst Nematode Variety Trials: Assess SCN resistant soybean varieties in NW MN.
2) Pest Management Issues in NW MN: a) Weed Management and Herbicide Impacts and Selection and b) Assess Soybean aphid varietal resistance.
3) Soybean Crop and Pest Survey: Conduct field surveys to report soybean crop stage and pest conditions in NW and WC MN.

Objective 1: SCN Variety Evaluation

The SCN variety trials partnership with the UMN Soybean Breeding program were established at four sites in NW MN (in Clay, Mahnomen, Norman and Pennington Counties). Plot sites were maintained by the PI, implementing necessary weed and insect management during the season. During post herbicide applications in June, several growth-regulator herbicides were unknowingly present in the crop oil used for the application. The resulting burn set back plants at the Clay and Norman plot locations. It was five weeks before plants resumed growth. Yields from these sites and a site at Kragnes were not taken due to these injuries and their impacts on normal plant development.

Harvest was completed in mid-October and variety results from Pennington and Mahnomen are compiled, summarized and formally published in the 2018 Soybean Field Crop Trials Results by Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences and can be found online (*https://www.maes.umn.edu/sites/maes.umn.edu/files/2018_soybean_final.pdf*).

Objective 2: Pest Management Issues in NW MN.

Sub-objective - **Weed Management and Herbicide Impacts and Selection**

Trial 1: *Effect of PPO-inhibitor herbicides on soybean yield:* As herbicide resistant weeds have become more problematic in NW Minnesota, the use of PPO-inhibitor herbicides has increased. One of the issues associated with the use of PPO-inhibitor herbicides is the level of soybean injury that can result from herbicide applications. UMN research in southern Minnesota has shown that soybean yields are not typically affected by PPO-inhibitor herbicides, especially with early-season applications. There has not been research determining the effect of PPO-inhibitor herbicides when applied to plants suffering from Iron Deficiency Chlorosis (IDC) symptoms prevalent in NW Minnesota.

We established three sites to evaluate the effect of six post-applied PPO-inhibitor herbicides on soybean yield at sites where soybeans may be stressed by IDC and SCN pressure. Applications were made on June 20, however the same contaminant that damaged each trial location and had to be abandoned.

Trial 2: *Herbicide-Resistant Weed Management Trial:* A weed control efficacy demonstration trial was established with 10 different pre or pre+post herbicide treatments after planting at the Kragnes breeding plot. Even though this site was impacted by the contaminant in the postemergence herbicide application, some useful observations were possible and were summarized and presented at August plot tours and on pages 12 and 13 of the "On-Farm Cropping Trials" booklet (https://mnwheat.org/wp-content/uploads/2019/01/2018-MWCReport-FINAL.pdf). Similar to UMN research in S MN, all layered herbicide treatments, which included a PRE herbicide followed by a POST residual herbicide, performed well providing greater than 90% control through mid-July.

Sub-objective - **Assess Soybean aphid varietal resistance**

Due to the chemical injury across plots at the locations where the aphid resistance plots were established, this objective was abandoned.

Objective 3: Soybean IPM Survey and Educational Activities

The coordinated NW MN/ND Soybean IPM Survey focusing on soybean aphid population densities surveyed 978 randomly selected fields from June 11 to August 24, with 434 visits in MN alone. This survey yields timely alerts to assist crop managers in making sound and economic management decisions.

Detectable aphid infestations were initially found in NW and WC MN in the June 19 - 22 week. Soybean aphid populations were most significant in central (C) MN first and then later in SC, SW and SE MN. Infestations in WC and NW MN were generally much smaller and only a small percentage of fields were treated, especially when compared to 2017.

All survey maps and past commentary can be found at the Cropping Issues in Northwest Minnesota on-line newsletter (http://blog-nwcrops.extension.umn.edu/) and the season-long results of this survey and an associated survey of wasps that are parasites of the soybean aphid can be found on pages 4-10 and 14-16, respectively.

Tech Transfer. Field Days for showcasing research plots, variety and breeding work have become an integral part of soybean outreach in northwest Minnesota. In August 2018 five plot tours were held in NW MN at the Swenson, Zurn, Potucek, Mehrkens and Theis Farms in Norman, Mahnomen, Marshall, Pennington and Polk Counties, respectively.

Four hundred eighty nine people attended summer plot tour events and winter meetings where this work was highlighted. Many more likely learned about this work through web posts, press releases, radio and pod cast interviews, the On-farm Cropping Trials booklet and other winter meeting events not held in NW MN.

Submitted by Angie Peltier (218) 281-8692, apeltier@umn.edu.