

Final Report

Project: 10-15-44-20229-7527

Project Title: **2020 NW Minnesota Soybean Research and Tech Transfer**

Institution/Organization: **Regents of the University of Minnesota**

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Project Synopsis:

Due to a hiring freeze and the need for social distancing necessitated by the nationwide Covid-19 epidemic the scope of the proposed project. Working with a communications specialist for the UMN Extension crops, the project worked to operationalize a distance diagnostics system to help Minnesota soybean producers to obtain preliminary diagnoses for in-season pest and disease issues. Similar to past years, this project also worked to hold several Soybean Tech Transfer Plot Tour-type programs with either Aaron Lorenz, the UMN soybean breeder, the new UMN soybean/corn weed science Extension specialist Debalin Sarangi and members of county Soybean & Corn Grower Associations.

Proposal Objective and Goal Statements:

- 1) **Work with UMN Extension web developers to stand up a distance diagnostics system.** (*PI: A. Peltier in cooperation with UMN Extension web developers and crops personnel*).
 - a) Work to develop a system into which Minnesota agricultural professionals (farmers, crop advisors, ag retailers) can upload digital pictures of crop disease symptoms or pests.
 - b) Establish a network of Minnesota Extension crop professionals to provide preliminary diagnoses and management recommendations to photo submitters.

During the early spring and early summer months the PI spent time meeting with colleagues on the UMN Extension crops team, the UMN learning technologies and web development teams and software salespeople trying to identify the best program to allow digital project management. To make the program as easy as possible on the farmer or other ag professional making the submission, the ideal software would provide a way to make a submission from a smartphone without needing a specific type of email account or having to login. Submitters should also be able to submit multiple pictures of symptomatic plants, there should be a way to automatically compile submission data into a database to track submissions over time and identify new or emerging diseases and there should be a way for Extension personnel to access submissions on-the-go from a smartphone.

A program called Smartsheet fit all requirements – subscribers can embed a fillable form onto an existing website that allows people to submit up to 10 photos from their

smartphone; the submission data populates different columns in a single line of a database; submissions can be automatically routed to Extension personnel acting as diagnosticians who can view submissions and complete a diagnosis using a smartphone while on the go.

The website that we created to house the fillable submission form is called Digital Crop Doc (z.umn.edu/digitalcropdoc), **Figure 1**. This program is set up to route to members of the UMN Extension crops team any soybean, corn, small grains, sugar beet and forage crop submission. Members of the team (Angie Peltier, Dean Malvick, Ryan Miller, Lisa Behnken, Bruce Potter, Liz Stahl, Jared Goplen, Jochum Wiersma & Ashok Chanda) have three business days to look at the photos and context clues submitted and provide to the submitter a disease diagnosis and management recommendations.

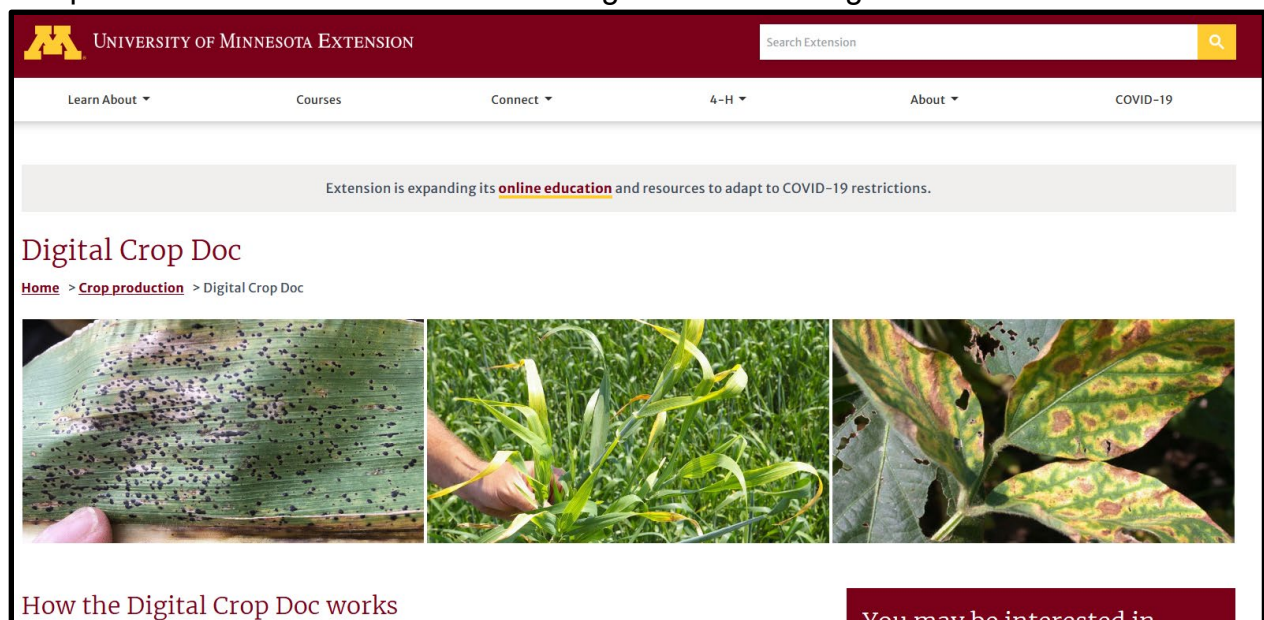


Figure 1. Screen shot of the UMN Extension webpage housing the Digital Crop Doc program.

Digital Crop Doc was launched on July 23, 2020. This launch date took place well in to the 2020 growing season and may have been the reason that this service only received a handful of submissions in 2020. This project was funded for the 2021 growing season by both the MSRPC and the Minnesota Corn Research & Promotion Council. In an effort to make sure that all Minnesota soybean producers are aware of this program, MSRPC funds in 2021 have been earmarked for two weeks of advertising regarding this program in the online newsletter *Minneline* and in the July/August issue of the Minnesota-specific *Soybean Business* print magazine.

2) Plot Tours at UMN Soybean Breeding Program and County Soybean Variety Trial Locations. (PI: A. Peltier in cooperation with A. Lorenz and county S&C Growers Assn. members)

- a) Take three round-robin scouting trips throughout the summer to identify potential emerging disease and pest issues and to identify pressing issues to address at summer plot tour events.
- b) Conduct five summer plot tour tech transfer programs.
 - i) Provide a venue for UMN Extension, MSR&PC, county soybean & corn growers association and seed company personnel to interact with soybean farmers in NW MN.
 - ii) Provide to farmers in NW MN research-based information about management of current pest or disease threats to soybean yield potential.

A total of four summer plot tour programs were held in NW MN in 2020 (**Table 1**) with the co-sponsorship of county soybean and corn growers' associations and the MSRPC.

Table 1. County and nearest city, program dates, speakers and topics of summer soybean plot tour programs.

County (nearest city)	Date	Speakers/Topics*
Marshall (Warren)	July 22	1, 2, 3, 4, 5, 6
Norman (Shelly)	August 24	1,4,5,6
Pennington (St. Hilaire)	August 25	1,2,3,4,5
Polk (Fosston)	August 25	1,3,4,5

*Speakers: 1) David Key, research director MSRPC, Topics MN Soybean is addressing that are currently making MN soybean production more difficult, 2) Garth Krueger, statistician and farmer, Using variety trial data to make seed selections for your farm, 3) Bill Craig, county soybean variety trial coordinator, Our emcee, 4) Angie Peltier, UMN Extension educator, MSRPC-sponsored projects in 2020, 5) Debalin Sarangi, UMN Extension weeds specialist, Managing Palmer amaranth and waterhemp in NW MN, 6) Aaron Lorenz, UMN soybean breeder, MN soybean breeding projects.

While the Marshall County growers' association chose to hold the program in July, the other three events were held, as they traditionally have been, in late August. Unfortunately, this year's August plot tour events occurred right in the middle of small grains harvest and some sugar beet pre-pile activities. While farmers have traditionally enjoyed being able to tour variety trial locations in late August -when varieties are well on their way to filling pods- future plot tour programs will be held in the middle of July with people welcomed to visit plots again on their own later in the growing season.

COVID-19-related travel and program restrictions resulted in fewer round-robin-type soybean surveys than would have been preferred. However, timely soybean growth and development, pest and disease management articles were delivered throughout NW MN through the Cropping Issues in NW MN digital newsletter (**Table 2**).

Table 2. Dates, titles and the number of readers of articles posted to the [Cropping Issues in Northwest blog](#) and pushed out to the related newsletter email list.

Date	Article Title	Readers
April 30	Controlling volunteer canola in soybean	992
May 21	Why it is worthwhile to plan now to sample for SCN this fall	1002
June 11	After recent storms, some may wonder what happens to flooded corn and soybean	1505
June 19	Black cutworms are in northwest Minnesota	1462
July 17	Introducing UMN Extension's newest program: Digital Crop Doc	1361
July 23	Save the date for NW MN soybean plot tour programs	1400
Aug 5	Defoliators reaching treatment thresholds in some NW MN soybeans	1328
Aug19	Details regarding NW MN soybean plot tours – August 24 & 25	1240
Aug 28	A tour of NW MN soybeans reveals disease & pest issues	1259
Sept 2	What is happening with my soybean crop as it inches closer to maturity?	1269
Sept 30	Why soil sampling for SCN matters	1065
Nov 24	A new way of managing white mold in soybean	1084
Total:		14,962