Virginia Carolina Peanut iPiPE: Data Sharing to Improve Disease Risk Models

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ABSTRACT

In VA and NC over 100,000 acres are planted to peanut with an annual value of over $85 million. Peanut is a high value crop, but inputs for controlling diseases can make peanut production cost prohibitive. Weather-based disease advisory programs have reduced the number of fungicide sprays required for control of peanut diseases, thereby reducing total fungicide inputs and costs in peanut production. However, disease risk is impacted not only by environmental conditions but also by field history and disease susceptibility of the peanut cultivar planted in a field. New tools, including those available in iPiPE that incorporate current information technology and commercially supported weather-based modeling, are needed to improve and disseminate IPM-based disease advisories for peanut.

OBJECTIVE

Update and improve current disease advisories for peanut in Virginia-Carolina region.

SIGNIFICANCE

- Growers currently use weather-based fungicide advisories for peanut in VA and NC.
- With new varieties and changes in weather patterns, these advisories need to be re-evaluated.
- Fungicide applications based on scouting and weather-based advisories reduce total quantities of fungicides applied compared to calendar-based sprays.
- Improving the accuracy of disease risk prediction models using iPiPE observation data will help growers maximize yields and profitability in peanut production.

METHODS

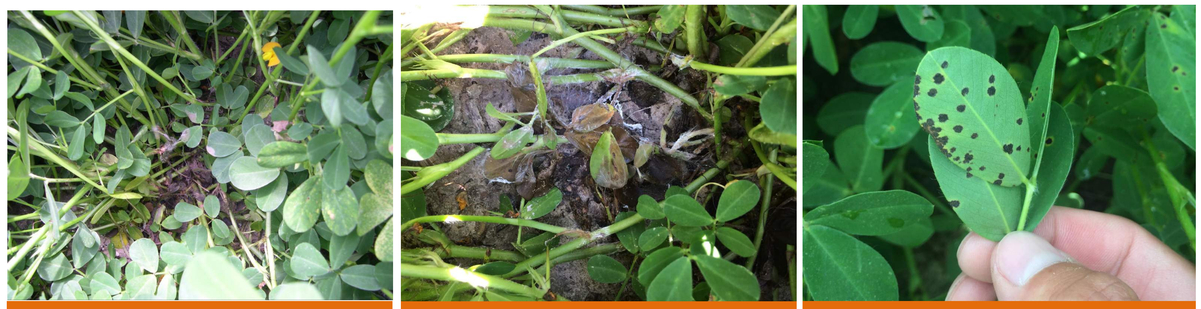
- Eleven fields in VA and NC were selected, and portions of fields were marked with flags and left unsprayed (Fig. 1).
- Fields were scouted weekly for Sclerotinia blight, stem rot, and leaf spot (Fig. 2).
- Results were uploaded to iPiPE using the mobile app.
- Disease models were run using weather data and compared to disease observations (Table 1, Fig. 3).

RESULTS

- Dates for when the leaf spot model predicted disease risk ranged from late May to mid-August, but little leaf spot was observed prior to September (Table 1).
- The model predicted disease risk at all locations around July 20, but the earliest disease observation was August 1 (Table 1, Fig. 3).

Table 1. Locations scouted, date of first disease observation, and date disease risk models indicated favorable conditions for infection.

Field ID	City, State	Leaf spot model	Leaf spot observation	Sclerotinia model	Sclerotinia observation	Stem rot observation
TAREC	Suffolk, VA	5/25/2017	8/15/2017	7/20/2017	8/1/2017	8/1/2017
Suffolk	Suffolk,VA	5/25/2017	none	7/21/2017	8/31/2017	7/19/2017
Franklin	Franklin, VA	5/29/2017	none	7/20/2017	none	none
PonyPen	Gatesville, NC	5/29/2017	none	7/20/2017	8/31/2017	8/23/2017
Tyner	Tyner, NC	6/16/2017	none	7/19/2017	none	none
Edenton 1	Edenton, NC	7/5/2017	none	7/21/2017	8/23/2017	8/23/2017
Edenton 2	Edenton, NC	7/5/2017	none	7/21/2017	none	none
Grabtown	Windsor, NC	8/15/2017	none	7/20/2017	8/23/2017	8/23/2017
Spellers1	Windsor, NC	8/14/2017	none	7/20/2017	none	8/23/2017
Spellers2	Windsor, NC	8/15/2017	none	7/20/2017	8/23/2017	7/19/2017
Cedar	Windsor, NC	8/15/2017	none	7/20/2017	8/31/2017	7/19/2017



***Sclerotinia minor*, causal agent of Sclerotinia blight** | ***Sclerotium rolfsii*, causal agent of stem rot** | ***Cercosporidium personatum*, causal agent of late leaf spot**

Figure 2. Peanut diseases observed in 2017.

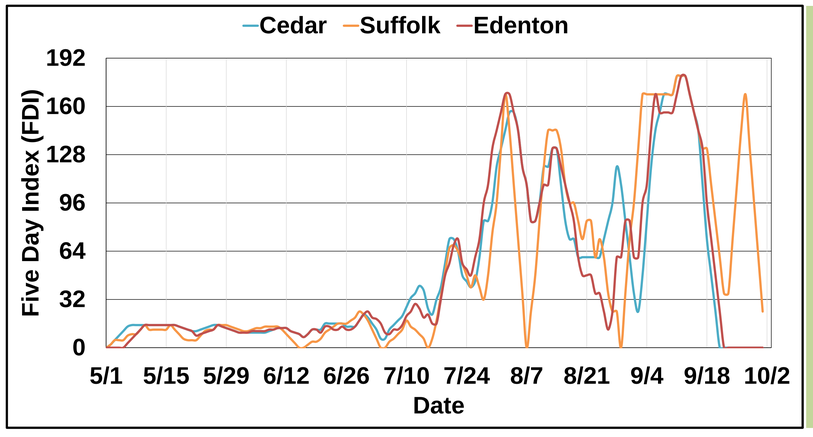


Figure 3. The five day index (FDI) for Sclerotinia blight risk with the current weather-based disease model being used for Virginia peanut advisories. Based on the model, all locations reached threshold (FDI = 32) by July 21, but Sclerotinia was not observed until August (see Table 1).

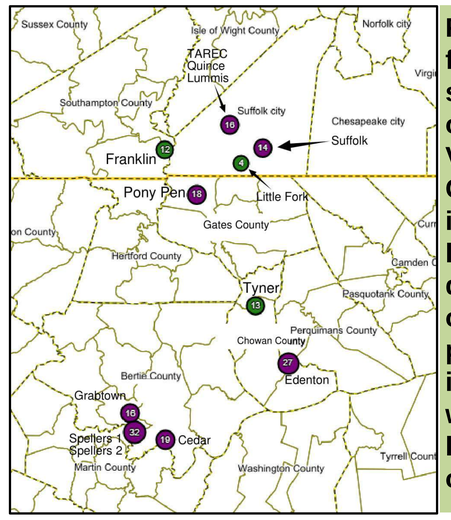


Figure 1. Map from iPiPE showing disease observations in VA and NC. Green circles indicate locations where disease was not observed and purple circles indicate disease was seen at the location at least once.

CONCLUSIONS

The current disease risk models overestimate disease risk. It may be possible to raise the spray thresholds and reduce and/or delay fungicide applications.

FUTURE RESEARCH

- Additional data will be collected in 2018 and compared to data collected in 2017.
- Data will be used to update leaf spot and Sclerotinia advisory models and to develop a stem rot risk model.

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