# EVALUATION OF THE STRIDER COTTON SCOUTING APPLICATION IN NORTHEAST TEXAS, 2018

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## Introduction

The Strider program is a field record-keeping program designed specifically for pest and crop monitoring. Field sample data, including pests, crop development, etc. is entered into a small tablet as it is collected in the field. Sample locations are georeferenced and a summary report is sent by e-mail to the grower, consultant and project manager. Other options include scheduling pesticide applications, recording pesticide use, and reporting trap captures. All field data are electronically captured, stored and summary reports are available as maps and Excel spreadsheets.

The Strider organization is located in Brazil and according to their web site, their technology is used on 2000 farms (3.7 million acres) in South America, Mexico and Australia https://strider.ag/en/. The Strider program has been used by Texas A&M AgriLife Extension as part of the Hale/Swisher County IPM program for several years. In 2018, we contacted Strider about our interest in gaining experience with their technology for possible use in the Texas A&M AgriLife Extension IPM program in northeast Texas. They graciously provided on-site training, tablets, and followed up with on-line training and support. Although there is a per acre charge for using Strider, the company waived that fee for this project.

## 2018 Program Description

Adam Ghamrawi, representing Strider, provided four Galaxy Tab Elite tablets and led two four-hour training sessions on using Strider in Greenville on May 19 and in Dallas on June 22. The Strider program came loaded with pests and control thresholds used by the Hale/Swisher County IPM program. It was necessary to modify the thresholds to reflect those used in East Texas cotton production. Pest densities (severity issues) are color coded in the summary report as green: below treatment threshold, yellow: approaching threshold and red: above threshold. These thresholds, with some modification, were taken from the Texas A&M AgriLife Extension publication 2018 Managing Cotton Insects in Texas: https://www.texasinsects.org/cotton.html. Also, methods to calculate and report densities of pests and their life stages and crop damage (cotton square retention, bollworm damage) were provided to Strider and incorporated into the East Texas protocol (see Appendix).

Field scouting data were collected from ten cotton fields, 486 acres, (Table 2) weekly beginning in early July through August. Field boundaries of each field were outlined using Google Earth and saved as .kml files, and e-mailed to Strider in Brazil. On most sample dates, five plants were sampled in each of five locations for a total of 25 plants per field. Due to its large size, eight sites were sampled in the replicated agronomic cotton evaluation (RACE) field. Sampling methods were those described in the Texas A&M AgriLife Extension publication 2018 Managing Cotton Insects in Texas.

Prior to leaving for the field each day, internet access is required to “update” each farm. This alerts the scout to any “tasks” set by the IPM Manager. Tasks can include notices regarding which fields to scout, specific areas to sample or re-sample, and can be georeferenced. Once the farms are updated, internet access is not needed to sample fields. Upon reaching the field, the scout opened the tablet, selected the farm, and begin entering sample data. Data cannot be entered unless the scout is within the boundaries of the field. Data points are georeferenced as is the route traveled by the scout through the field. The tablet also records the distance traveled by the scout which could be used in calculations. Data are saved on the tablet and once internet is available, can be saved to the cloud. At the same time, a summary report is e-mailed to the grower, consultant and IPM manager as appropriate. This report highlights pest densities in green, yellow or red according to the pre-set threshold levels (Table 3).

The IPM manager can access the full scouting report on-line via the "Site Panel" which is password protected at http://painel.strider.ag. At this site, the manager can also view a field map showing the scout's path through the field, sample sites, and a color-coded "heat-map" for each pest and field (Fig 1). The manager can also set tasks for individual scouts as discussed earlier. Reports, as Excel sheets, can be generated for each field showing the average pest density for each sample date.

Many features of the Strider program are also available for use on a mobile phone. A comparison of the options available via tablet or mobile phone are shown in Fig. 2.

## Conclusions

The Strider app proved to be an efficient and convenient means of collecting field scouting information. Advantages and disadvantages are listed below. Plans are to use Strider for the Texas A&M AgriLife Extension IPM program in East Texas in 2019.

As part of this project, one tablet was provided to Pat Pilgrims Farms PPF for field testing in their very large (ca. 70,000 acres) field scouting program. However, due to the time to learn how to use the Strider and customize it for East Texas cotton, it was not "field-ready" until early July. At that time, the PPF scouting program had been active for two months and there was not sufficient time to integrate it into their program. However, they remain interested in using Strider, either using the tablet or cell phone format.

### Advantages

Improves communication between field scout, grower and program manager.

Improves management of field scouts. Manager can easily assign tasks and confirm that the scout has received the task notice. Also, managers can track scouts and their route through the fields.

Images of pests are loaded in the program to assist scouts with infield identification.

Improves quality control of sample data. Average pest densities and damage are automatically calculated, avoiding math errors and saving time in the field. Also, tracking scout's path through field ensures adequate field coverage.

Eliminates the need for paper copies of scouting reports. Scouting reports are now completed in triplicate and physically distributed to the grower, manager and a third to be filed.

Scouting report is e-mailed to grower and IPM Manager. As the paper copy may not reach the grower's attention for days, a pest above threshold can result in crop damage. The e-mailed summary can be quickly read and is color coded to highlight pests exceeding the treatment threshold.

Scouting reports are quickly and easily accessed and summarized electronically. Paper copies must be physically filed and data entered manually for summary reports.

Excellent and timely on-line support from Strider. Strider provided on-line training and web-based consultation and questions or problems where quickly addressed by the Strider support (Customer Success Consultant) via e-mail.

Although not used in this project, other options in Strider allow for contacting a pesticide applicator to schedule field treatment, record pesticide applications, and manage pesticide inventory.

### Disadvantages

The tablet was difficult to use in the field due to glare from the sun. Strider provided anti-glare screens which helped.

Text on the tablet was difficult to read due to small font size and red letters on a black background. Also, pop-up boxes for entering data often obscured relevant information to the collection request.

The above difficulties sometimes resulted in entering an incorrect number which was not noticed until the data were saved. The only way to correct such an error was to contact the Strider support group.

For some locations, GPS was not consistently available. It is not known if this was a tablet problem or due to some other factor. The tablet did still allow for recording a not georeferenced data point.

The representation of beneficial insects needs to be modified as they are currently treated was pest in the warning color scheme and a pesticide treatment is recommended.

Saving an infield image of the crop progress or a pest was not intuitive.

There were a minor number of prompts that were still in Portuguese.

## Acknowledgements

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Table 1. Thresholds, or severity Issues, color coded for East Texas cotton production. Thresholds shown in red required an insecticide treatment.

| **Issue** | **Green** | **Yellow** | **Red** |
|---|---|---|---|
| Aphids | Less than 25/leaf | 25-39/leaf | 40 or more /leaf |
| Bollworm Eggs | Less than 10/100 plants | 10-19 / 100 plants | 20 or more /100 plants |
| Small bollworm larvae | Less than 4 /100 plants | 4-5 /100 plants | 6 or more/100 plants |
| Medium bollworm larvae | Less than 2/100 plants | 2-3/100 plants | 4 or more /100 plants |
| Large bollworm larvae | Less than 2/100 plants | 2/100 plants | 3 or more /100 plants |
| Fruit damage by bollworm | Less than 4% | 4-5 % | 6% or more |
| Cotton fleahopper | Less than 5/100 plants | 5-9/100 plants | 10 or more/100 plants |
| Square retention | 85% or more | 70-85 % | Less than 70 % |
| Lygus bug | Less than 2 / six row feet | 2-3/ six row feet | More than 3/ six row ft. |
| Spider mites | Less than 10 % damaged plants | 10-39% damaged plants | 40% or more damaged plants |
| Stinkbugs | Less than 10 % boll damage | 11-19 % boll damage | 20% or more boll damage |
| Thrips | Less than 0.5 / leaf | 0.5-0.9 / leaf | 1 or more per leaf |
| Other caterpillars | Less than 0.2 /plant | 0.2-0.4 / plant | More than 0.4/plant |
| Beneficial insects | Less than 20/100 plants | 20-40 / 100 plants | More than 40/100 plants |

Table 2. Cotton fields monitored using Strider

| | **Field** | **Acres** | **County** |
|---|---|---|---|
| 1 | CCRI East | 66 | Hunt |
| 2 | CCRI Mid | 16 | Hunt |
| 3 | CCRI MidWest | 15 | Hunt |
| 4 | RACE Trial | 156 | Delta |
| 5 | Princeton Big Field | 47 | Collin |
| 6 | Princeton Cemetery | 13 | Collin |
| 7 | Princeton Triangle | 17 | Collin |
| 8 | Gidney South | 67 | Collin |
| 9 | Gidney 204/206 | 43 | Collin |
| 10 | Gidney Substation | 46 | Collin |
| | | 486 | |

Table 3. Sample of scouting summary sent to grower and IPM manager.

**From:** Strider Agro <noreply@strider.ag>
**Sent:** Monday, July 30, 2018 5:58 PM
**Subject:** Daily Resume - Jul 30, 2018 - CCRI East Farm Cotton

More information
painel.strider.a

Last samples of your farm.

Area East Farm Cotton\CCRI East Farm Cotton 2018 - Jul 26

Issues 8 sample(s) in 1,422.57m

***Beneficial Insects***
*7 samples(s)*

**Number of Beneficial Insects per 100 Plants**

122.50 Insects/100 Plants

Jul 12 39.52

***Fleahopper***
*1 samples(s)*

**Total No. of Cotton Fleahoppers/100 Plants**

2.50 Fleahopper/100Plants

Jul 18 20.00

***Fruit Damage by Bollworm***
*1 samples(s)*

**Percentage of Damaged Fruits**

0.36 %

***Cotton Bollworm***
*3 samples(s)*

**Number of Eggs per 100 Plant**

10.00 Eggs/100 Plant

Jul 12 87.62

**Number of Small Bollworms per 100 Plants**

2.50 Bollworms/100 Plants

***Cotton aphid (Aphis gossypii)***
*2 samples(s)*

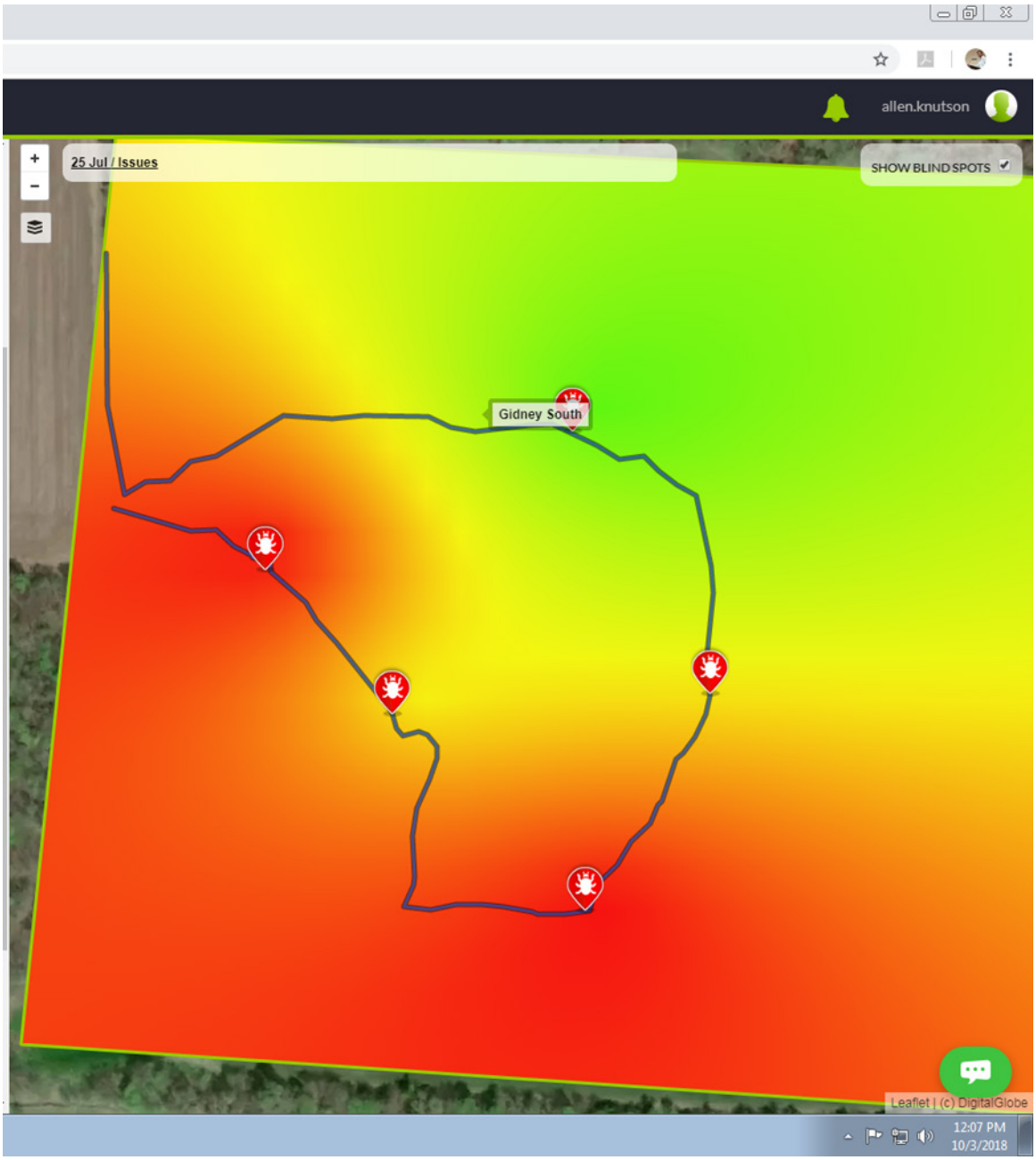


Figure 1. "Heat map" showing route of field scout through a cotton field and five sample sites. Areas in red are above treatment threshold, green are below threshold and yellow is intermediate.