



# CSI: Crop Science Investigators

A STEM investigation project  
for secondary school students.

Your school is invited to attend a one day mini field day  
to explore technology, innovation and opportunities in  
the Australian grains sector.

*Explore ...*

*Hands-on  
activities*

**Plant  
breeding and  
genetics**

**Drones,  
precision ag  
stubble  
management**

*Discover*

**Soil health  
and pests in  
the paddock**

**Weather  
monitoring  
and reducing  
spray drift**

*Invent*

**Agricultural  
engineering**



## CSI: FIELD DAY

This year, with support from the South Australian Grains Industry Trust, AgCommunicators and delivery partners such as SARDI, The University of Adelaide, Flinders Machinery, Kelly Engineering, Ag Excellence Alliance and Hart Field Site Group, are delivering a pilot program which engages students in how research, technology and innovation are being used to solve global problems such food production to support a growing population.

## THE PROGRAM

On Friday 21st of September, students from nine mid-north schools will attend a mini technology field day where they learn about the Australian grains industry. Students will rotate through seven workshops to explore machinery innovation and agricultural engineering, drones, precision agriculture, plant breeding and genetics, soil health and monitoring weather for improved input applications.

The day will demonstrate technologies and innovations currently being used to produce more grain per meter of soil, per millimeter of rainfall. The industry is achieving great things but there are some challenges ...

## THE ISSUES

As students learn about the innovations, they will also explore challenges faced by the industry. For example how do we:

- Increase crop yield without clearing more land?
- Ensure a better distribution of food globally?
- Reduce pests and disease both in the paddock and in storage?
- Grow plants in climates which have reduced water or face more droughts?
- Reduce chemical use, develop more natural products or use them in a more sustainable manner?
- Monitor weather to make better farm decisions?
- Reduce emissions
- Improve soil fertility and health.



## CSI: Student Investigation Challenge

Following the field day, students conduct an in school research investigation to understand and then work to develop a solution to address an issue / challenge of choice. The project will go over a ten week period [term 3/4] and will be supported by a range of scientists, industry experts and of course your teacher. We will conduct class visits and are available via phone / skype to offer support as required.

### CSI AIM

Students work individually or in teams of two to research an issue of choice and then generate a new solution / innovation or concept. The ultimate aim is to generate a solution / innovation or concept to help increase sustainable food production to feed a growing population using STEM thinking. You can develop a totally new concept or improve an existing one.

### YOUR PROJECT

Your project should include:

- An introduction summarising the issue faced by the grains industry [i.e. describe and outline the situation considering current research];
- A concept proposal, which is a detailed description of your innovation / invention. You need to describe how it works and how it will help solve a problem faced by the grains industry.
- A labeled 3D model, developed in a CAD [or related] program or built in 3D using relevant materials, showcasing your invention and its features. Alternatively, students can create a 1 minute video clip and present their concept as a new bulletin.
- A discussion which outlines the instructions for its use and potential benefits for the industry. STEM thinking is a must!

### COMPETE

Each school selects the TOP FIVE entries, which will be judged in a inter-schools competition. Entries will be judged on their understanding of the topic, background research, concept and the actual model. Winners receive great prizes!





## Tips & ideas

### Some ideas

## CSI: Student Investigation Challenge

The competition encourages you to be as creative as you like! The idea is to think of a new innovation, process or concept. But you must think about its application and the way it would work.

Here's some ideas: A student we trialed the idea with came up with the concept of developing a locust catcher, which consisted of two drones carrying a structured mist net to capture plagues of locusts. This idea reduces the need for chemical sprays. The student proposed that the captured locusts should be used as fish feed in aquaculture businesses! Another student invented a new farming letter box system so when you came in your front gate, a screen would tell you what the weather was, what the humidity was and if it was ok to carry out certain farming tasks.

Other ideas might include a new laser robot to kill weeds, a solar heater that prevents frost damage in crops, or a solar generated tractor. The opportunities are endless!

### YOUR IP

This project is about supporting and encouraging STEM Thinking and innovation. If a student has a great idea, it is their idea to keep. We are not giving away their ideas of IP to any third party. If students have an outstanding idea with commercial applications, they are encouraged to seek professional commercial advice and they can work to get their idea to market and / or protected.

## CSI: Field Day Agenda:

### Friday, 21<sup>st</sup> September 2018 - Booleroo Centre Oval

| Time  |   |   |
|-------|---|---|
| 9:45  | <b>Students arrive and be seated in main marquee</b>                                    |   |
| 10.00 | Welcome<br>A bit about the Australian grains industry<br>Introduction to YOUR challenge | <i>Belinda Cay<br/>Director, AgCommunicators</i>  |
| 10.15 | Plant breeding for a growing population   | <i>Professor Andrew Barr<br/>Andrew Barr Consulting</i>   |
| 10.45 | Rotations begin: students will spend 20 minutes at each station FOUR ROTATIONS          |   |
|       | <b>GROUP</b>  | <b>ACTIVITY</b>   |
|       | 1.  | STATION 1: Australian grains – agronomy, quality and production. Rebekah Starick, AgCommunicators.                                |
|       | 2.  | STATION 2: Precision Agriculture and Drones. Dr Rhiannon Schilling, The University of Adelaide.                                   |
|       | 3.  | STATION 3: Soil borne Diseases, Dr Katherine Linsell and Dr Tara Garrard, SARDI.  |
|       | 4.  | STATION 4: Weather monitoring to reduce spray drift, Mark Stanley and Dr Sarah Noak, The Mid North Mesonet pilot project.         |
|       | 5.  | STATION 5: Plant breeding and genetics for improved cereal crops, Belinda Cay and Professor Andrew Barr.                          |
|       | 6.  | STATION 6: Agricultural engineering and innovative machinery design, Luke Ellery, Kelly Engineering.                              |
|       | 7.  | STATION 7; Harvesting grain for maximum protein and maximum profit. Barrie McCallum (Flinders Machinery) and Peter Thompson (CNH) |
| 12.10 | Lunch   |   |
| 12.40 | Rotations resume: students will spend 20 minutes at each station THREE ROTATIONS        |   |
|       | <b>GROUP</b>  | <b>ACTIVITY</b>   |
|       | 1.  | STATION 1: Australian grains – agronomy, quality and production. Rebekah Starick, AgCommunicators.                                |
|       | 2.  | STATION 2: Precision Agriculture and Drones. Dr Rhiannon Schilling, The University of Adelaide.                                   |
|       | 3.  | STATION 3: Soil borne Diseases, Dr Katherine Linsell and Dr Tara Garrard  |
|       | 4.  | STATION 4: Weather monitoring to reduce spray drift, Mark Stanley and Dr Sarah Noak, The Mid North Mesonet pilot project.         |
|       | 5.  | STATION 5: Plant breeding and genetics for improved cereal crops, Belinda Cay and Professor Andrew Barr.                          |
|       | 6.  | STATION 6: Agricultural engineering and innovative machinery design, Luke Ellery, Kelly Engineering.                              |
|       | 7.  | STATION 7; Harvesting grain for maximum protein and maximum profit. Barrie McCallum (Flinders Machinery) and Peter Thompson (CNH) |
| 1.40  | Drones presentation   | <i>Dr Rhiannon Schilling<br/>The University of Adelaide</i>   |
| 1:55  | Closing presentation<br>Where to from here!   | <i>Belinda Cay<br/>Director, AgCommunicators</i>  |
| 2:00  | Close   |   |

# CSI: Crop Science Investigators

A STEM investigation project  
for secondary school students.

Thanks to our supporters



Government of South Australia  
Primary Industries and Regions SA

Additional support from Grain Producers SA, Northern Yorke  
NRM, Wine Grape Growers Ass, BoM

Project  
Delivery

