Crop trials – an industry perspective

The South Australian Grains Industry Trust (SAGIT) used grower levies to fund the South Australian Research and Development Institute (SARDI) to conduct a three year trial program on the Eyre Peninsula titled **"Improving the Early Management of Dry Sown Cereal Crops".**

Amanda Cook, Research Officer with SARDI's Minnipa Agricultural Centre has kindly shared the presentation she gave at the SAGIT Industry Update in 2023.

It provides excellent insight into the industry importance of crop trial work and highlights the fact that even simple agronomic concepts are extremely important for farmers to understand and require rigorous testing to enable researchers to provide reliable advice.

The presentation and concepts discussed provide an opportunity for students to prepare for practical scientific trials such as AT1 Design & Deconstruct investigations and AT3 Ag Systems Experimental investigations.

About the experiment

This three-year trial investigated crop establishment in dry sown wheat crops. Dry sowing is an important strategy being used more commonly as farmers look for efficient ways of covering large areas at seeding time. The experiment was conducted on the Eyre Peninsula and aimed to investigate soil factors which affect germination and crop establishment. Specifically, it assessed the impact of management on wheat seed establishment on three different soil types in field trials and pot experiments for the impact of: Nitrogen and Phosphorus fertiliser type and placement, herbicides and seed dressings.

The **independent variables** investigated were:

- Soil type (red loam, sand, grey calcareous sandy loam)
- Fertiliser placement (with seed, 3cm below seed, 50:50 with seed and below, fluid)
- Fertiliser type and rate (DAP and MAP +/- urea, Phosphoric acid + urea)
- Herbicides (Trifluralin, Boxer Gold and Sakura)
- Fungicides (Baytan, EverGol, Uniform plus EverGol, Tebuconazole @ 50ml/100kg seed, Flutriafol on fertiliser @ 166ml/100kg DAP)
- Seed placement (2-3cm, 3-4 cm (standard practice), 6-7cm)

*** Teachers must discuss and consider the safe use of chemicals and fertiliser with students and conduct their own risk assessment prior to using these in any experiment.**
*** Schools must ensure the required PPE is provided prior to commencing any experiment.**

It is important to note that while this trial investigated multiple factors, students should not investigate more than one independent variable as this generates an enormous amount of data and is too complex to analyse within the constraints of the SACE Externals or AT1 investigations

The **dependent variables** used to assess the trials included:

- Germination percentage
- Emergence percentage
- Plants/m^2 (note: a useful benchmark is 180 plants/m^2 for cereals)

Key findings for students:

- Simple agronomic decisions are valid for investigations
- Pot trials are OK! But ensure you have the same size, shape and coloured pots to ensure you account for any variables.
- Watering regimes and sowing conditions for pot trials should be controlled to mimic paddock conditions
- Having a "no fertiliser" control is important
- Placing fertiliser with seed reduced plant establishment (slide 8, 16, 17)
- Soil type had a big impact on germination (slide 16)
- Early crop vigour does not necessarily equal higher yields (slide 8, 17)
- Fungicides and herbicides did not generally impact plant establishment (slide 10)
- Sowing depth is important (slide 10)
- Fertiliser helps! (slide 17)
- It can be hard to achieve target plants/m^2 (slide 17)
- Dry sowing can affect yield positively or negatively, depending on seasonal factors (slide 18)
- Industry trials are really important for researchers to be able to make practical recommendations to farmers (slide 20, 21)
- Collaboration between industry funding partners and government research programs deliver results that are useful for farmers (SHE links!!)

Further resources:

- South Australian Grains Industry Trust SAGIT | South Australian Grain Industry Trust
- South Australian Research and Development Institute (SARDI) SARDI - South Australian Research and Development Institute - PIRSA
- Minnipa Agricultural Centre Minnipa Agricultural Centre - PIRSA