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CASE STUDY | FEBRUARY 2025

Understanding the common factors driving yield in Tasmanian pea production

Midlands, Tasmania demonstration site

KEY MESSAGES

- Comprehensive data collection from a number of crops can be used to better understand key drivers of crop performance via benchmarking. Such data would have to be collected over several years to confirm that key findings hold true under different climatic and soil conditions and diverse rotations.
- The results from this one year study of 12 crops highlighted that a pilot benchmarking study is valuable for developing an efficient data collection and analysis approach for future benchmarking studies.
- The first data set provided insights into potential drivers of processing pea yield in the Tasmanian Midlands. These findings need to be confirmed or dismissed using follow on studies in coming years.
- A one-year study in one region does not provide enough data for extrapolation to other years and regions. Annual benchmarking over several years and regions would be required to develop meaningful recommendations.
- Still, a one-year study is valuable for all participants because data, knowledge and experiences are shared and the networks that are created continue to operate. The participants' field walks and discussions during the season and final review of findings added important information to the benchmarking data set. This information is important for the design of follow up studies.

Hort Innovation

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Introduction

Tasmania grows approximately 99% of Australia's processing peas for Simplot Australia. Peas are grown in a range of soils and climatic regions throughout the state. They are a beneficial rotational vegetable crop for many Tasmanian farming systems; for instance, other vegetable crops, poppies, grains, seed crops, potatoes and pyrethrum. Most pea growers also run livestock so that pasture can be part of the rotation. Pea crops can be a good source of organic matter and nitrogen with a positive effect on soil health, similar to a cover crop.

With input costs rising faster than grower returns for pea production, it is becoming a more marginal crop to grow – if the positive effects on soil health are not considered. Therefore, Simplot's field and research team and a group of contracted growers wanted to investigate which factors were driving high pea yields and understand what factors would prevent a pea crop from reaching its full potential.

VegNET Tasmania and the Soil Wealth ICP project worked with Simplot staff and 12 pea growers in the Cressy, Hagley and Epping Forrest regions to collect, analyse, and benchmark crop data and share observations and experiences during the 2023/24 season.

This case study presents which data has been collected and the common factors that led to good pea yields in the selected regions in the 2023/24 season.

Information collected and evaluated

The type of data to be collected was discussed among the Simplot and project teams. Decisions on data collection were made based on experience in pea production, previous research, the available budget and capacity of all involved. Data was collected at key points during the crop cycle as listed in Table 1.

Observations on how the season and the 12 crops were progressing were exchanged and noted during field meetings. All benchmarking data was presented and findings as well as opportunities for focussing data collection in the future were deliberated at a wrap up meeting after harvest.

Table 1: Data collected for each pea crop

Sowing	Establishment	In-season	Harvest
• Planned sowing date • Actual sowing date • Variety	• Established population per square metre (pl/m^2) • Establishment conditions • Drone photographs	• SILO (Scientific Information for Land Owners) climate data – precipitation and radiation • Normalised difference vegetation index (NDVI) • Fertiliser inputs • Irrigation rates and frequency • Spray inputs • Flowering sap tests	• Yield • TR (tenderness rating) reading • Value ($/ha)

Crop visits with participating growers, agronomists, Simplot and project staff were conducted during the growing season. They included reviews of data collected so far such as soil and plant test data, NDVI and satellite images and crop performance, as well as grower-led discussions to share seasonal observations and experience. These in-paddock discussions also covered water availability, water quality and effective irrigation, the role of soil biology, weather impacts and other factors driving yield.

After harvest, a comprehensive benchmarking report was developed for each participating grower which provided a detailed crop and seasonal overview. It included the grower's data and a set of benchmarks from across the group to show them how their crop compared to others. In each individual grower's report, data from other crops was de-identified; averages were also used.

Simplot received a detailed study report.

Key findings

Three of the 12 participating growers produced high performing pea crops. The definition of a high performing pea crop was based on Simplot's criteria of yield and quality. The project team analysed the data and found the following consistencies for the 2023/24 season across the three high performing crops:

- Seeder type and operator
- Inclusion of fertilisers containing sulphur in the nutrition program
- Relatively low amounts of nitrogen fertiliser were applied to the crop compared with others in the group
- The soil calcium to magnesium (Ca:Mg) ratio was 4.3-4.5 which is desirable
- Plant counts at establishment of between 90-100, which is the optimum density according to previous research.

The high performing crops also did not receive the potassium fertiliser Muriate of Potash (MoP) which contains about 46% chloride (Cl). Crops only need a very small amount of Cl and high inputs may affect soil health. Salinity (e.g. high chloride and sodium levels in the soil) naturally occurs in areas of the northern Tasmanian Midlands where the pea crops were grown. This means soils may already have elevated chloride levels which can reduce crop productivity, if not managed carefully. Therefore, adding chloride to crops via fertiliser may add to the negative effect salinity can have on crops.

Most soils used for the pea crops that were investigated had optimum pH levels of 6-6.5. This pH range ensures good availability of macro- and micro-nutrients, if soil levels are adequate.

Photo: Networking during field visits is an important part of sharing information on new approaches and dealing with common challenges.

Observations

Participating growers, Simplot staff and agronomists had a high level of interest in the study and field discussions were lively. Most of the participating growers did not know each other before the study; they enjoyed the new network and exchange of experiences as well as discussing the benchmarking data.

"It was great to see so much in-depth information about [my] pea crop," one participating grower said.

Conclusions and next steps

The results from 12 crops in the Northern Midlands conducted over one season do not provide sufficient data that can be extrapolated to other regions and years. However, the study provided an approach to build on and valuable information on the type of data that should be collected in the future to investigate drivers of good crop performance. It provided a template that can be used to collate, analyse and report crop benchmarking data efficiently. The approach and data template can now be used in other years, regions and crops in the future.

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