

Sustainable Vegetable Systems

Quarterly Report - Programme Governance Group

Quarter 4, April – June 2021

Contract Agreement Number: 21859



Ministry for Primary Industries
Manatū Ahu Matua



In partnership with:



Sustainable Vegetable Systems

1.1 Summary of progress during this quarter

Workstream 1 – Controlled experimentation to quantify nitrate leaching

- Workstream 1 completed the first year of rotations and full analysis is available in the annual report (Searle et al. 2021). This has been included in the PGG papers.
- At The New Zealand Institute for Plant and Food Research Incorporated (PFR), Lincoln, Rotation 1 has completed the potato and wheat part of the rotation, and the subsequent crop of broccoli has been planted. The Rotation 2 pak choi has just finished, and data compilation is being completed. The subsequent cover crop of oats has been sown.
- The initial analysis of the potato – wheat crop of Rotation 1 indicates that there was no effect of previous potato crop nitrogen (N) treatment on yield of the subsequent wheat crop. However, the uptake of N by wheat was higher in the N4 treatment, due to higher soil N at the time of sowing wheat.
- In Hawke’s Bay, the pak choi crop of Rotation 2 has been sown, and measurements are under way. Preparations are being made for sowing onions in Rotation 1 in early spring 2021.

Workstream 2 – Regional on farm monitoring

- Monitoring continues on the 9 sites. All sites have completed their first crop, followed by fallow periods of between 1 to 6 months, and are now into pasture or their 2nd vegetable crop.

Actual Site No.	Year 2020						2021						
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1	Cover Crop (ryegrass cut and carry)						Fallow						Onions
2			Barley (crop/cover crop)				Fallow						Onions
3			Mustard				Fallow						carrots
4			Potato - Russet Ranger				Fallow			Cauliflower			
5				Potato - Nadine				Fallow				Onions	
6			Maize silage							Fallow		Grass	
7				Pumpkin				Fallow			Grass		
8			Potato							Fallow		Wheat	
9				Pumpkin				Fallow		Fallow		Turf grass	

- All sites are being monitored monthly following the soil and plant sampling protocol developed in consultation with the Technical Panel.
- The regional monitors meet on the last Monday of the month, along with PFR, to raise any H&S issues, update progress, and discuss any issues and ideas amongst the widely dispersed group.
- A database of all monitoring records has been created. This includes soil chemical analysis, bulk density, soil moisture, plant analysis, grower inputs (fertiliser, irrigation, cultivation practices, yields), weather station data, and NIWA virtual climate station data back to 1972.

- While during monitor site selection the growers at each site agreed to the project data collection based on anonymity, the formal Site Agreements are still being refined. These will be completed and signed in Q1.
- The individualised benchmarking reports have been further refined and socialised with the regional monitors.

Workstream 3 – Farmer facing tool(s)

- PFR has undertaken initial modelling of the potato – wheat rotation. This has been undertaken in Simple Crop Resource Uptake model operating with the Agricultural Production Systems SIMulator (SCRUM–APSIM). It has been highlighted that the water flow model needs improvement, and will become a greater focus in Year 2.
- The first agronomy workshop was held in May. The purpose of the meeting was to:
 - bring this group together for the first time and bring the participants up to speed on SVS.
 - add in crops to Overseer modelling workstream
- While the use of Overseer is uncertain the underpinning crop modelling will be the same irrespective of the software that sits over the top.
- Discussion on crop parameters and coefficients highlighted the importance of consistent terminology. This included test names through to area definitions (total area, effective area – bed area, headlands, wheel track, etc., yield)
- Identified that better data is required on crop growth periods, time to reach max./full cover by region and season, biomass and its distribution.
- Some of the data gaps are unlikely to be plugged through existing trials and 9 monitor sites. Therefore, the recommendation was to expand crop sampling targeting prior to harvest. This will also increase the number of growers that the project draws into the monitoring and consequently great industry engagement and buy in.
- The modellers and model users meeting was delayed until July to better fit with peoples’ availability.

Workstream 4 – Developing a change landscape

- The WS4 leadership team developed the baseline grower survey and deployed it across the industry.
- FOLKL was contracted to deliver the survey.
- The survey was completed at the end of June, with analysis and a final report in July.
- PFR social science team has been working with industry to organise the grower and agronomists focus groups. These meetings will be held around the country in August and September. To empower growers requires spending time with them to better understand what they do, why they do it, what is difficult, and what they see the shape of the future being.

- Through this deeper dive approach SVS will gain a better view of growers' and agronomists' ability to undertake a complete nitrogen budget, establish the tools that they are already using, their level of confidence, and barriers to change.

The insights gained from the focus groups and interviews will inform the dissemination programme.

1.2 Key highlights and achievements

- Workstream 1. At PFR, Lincoln, Rotation 1 has completed the potato and wheat part of the rotation, and the subsequent crop of broccoli has been planted. The Rotation 2 pak choi has just finished, and data compilation is being completed. The subsequent cover crop of oats has been sown.
- Workstream 2. All nine monitoring sites continue with the data now being collated into a central database and results feeding through into individualised benchmarking reports.
- Workstream 3. Initial modelling of the potato – wheat rotation has been undertaken in Simple Crop Resource Uptake model operating with the Agricultural Production Systems sIMulator (SCRUM–APSIM). The modelling and model users workshop has been planned and will be conducted in July.
- Workstream 4. The baseline grower survey was deployed and 112 responses received back. The analysis and final report will be completed in Q1. SVS has a monthly article in the NZGrower magazine. A plan for story ideas has been prepared and includes: SVS description and progress update, baseline survey results, common soil testing terms and their usefulness, and nitrogen budgets.

1.3 Collaboration with other programmes (optional)

- The PFR led SFF 'Mineralisable N to improve on-farm N management' project, is working with the PFR SVS Leadership Team to ensure data and knowledge is shared across the two projects. These projects have shared stakeholders and PFR has aligned the two projects by adding the relevant N mineralisation measurement protocols (field and lab) to the SVS trial plans. A joint presentation is planned for the HortNZ Conference in August. Likewise, a joint NZGrower article is being prepared.
- Overseer continues to be informed on progress through the quarterly reports. Overseer is attending the modellers meeting in July.
- Measuring real time nitrogen losses in HB vegetable production, a Rural Professional Funded project led by Ravensdown and includes PFR. We continue to be kept updated on this project's progress. Results are currently being analysed and an extension funding has been submitted.

1.4 Upcoming

- WS1 trials in Hawke's Bay Rotation 2 is about to be sown in onions, followed by a grass crop. Rotation 2 has a very intensive lettuce winter crop, followed by peas and cauliflower.
- WS1 trials in Lincoln are about to be planted in onions following the broccoli. Rye grass will follow the onions. Rotation 2 will be in fresh market potatoes following the oats.
- WS2 will complete any outstanding grower surveys and collate the monitoring data into the database.

- WS3. The modeller and model users meeting will be held at Lincoln in July, following the first agronomists meeting in May. The intention is to then bring these 2 groups together in order to focus on what the Farmer Facing Tools should deliver. This will be informed by the PFR social science focus groups and interviews. The Overseer review will also significantly inform these discussions.
- WS4. Focus groups and grower interviews to be conducted in Q1. NZGrower articles on soil testing terms and nitrogen budgets. Presentations at the HortNZ conference and Potatoes NZ Industry Forums.

1.5 Investment (Cash & In-kind)

Investment period	Co-investor contribution	MPI contribution	Total investment
During this quarter	\$0.150m	\$0.370m	\$0.519m
Programme to date	\$0.671m	\$1.486m	\$2.156m

Note: this is the end of the public section of this Quarterly Report