



PFR SPTS No. 20835

## **Sustainable vegetable systems – Annual Report 2021**

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## Executive summary

### Sustainable vegetable systems – Annual Report 2021

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This report summarises work conducted in the first year of the Sustainable Vegetable Systems (SVS) project, and reports on progress for milestones and activities for the January to March quarter of 2021 undertaken by The New Zealand Institute for Plant and Food Research Limited (PFR).

#### 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.

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. Soil N decreased during the growth of wheat crop, and at final harvest averaged 12 kg N/ha for treatments N1, N2 and N3, but 24 kg N/ha for treatment N4. Thus, it appears that wheat used the soil N available well, but leaching data are still to be completed before a final conclusion can be made.

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.

The literature review was completed and showed a scarcity of data on nitrate leaching for vegetable crops in New Zealand. The review found that much of the available data was out of date and often based on estimations of leaching rather than empirical data.

#### Workstream 2

PFR oversaw initial site assessments and established protocols for sampling and data collection. Data have been collected from all sites, and final harvest is being completed at some. Measurements of crop and soil N content is being completed. Once all data are available, it will be compiled, analysed and used for modelling studies.

#### 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 model represents yield changes over time well, but does not capture water movement or soil N well. This has

highlighted the need to improve water flow modelling within SCRUM–APSIM, which is important for leaching calculations and further model development.

Meetings are being held with the final goal of identifying a best approach for modelling and development of the farmer facing tool.

#### **Workstream 4**

The focus group evaluations, interviews and survey are being designed and will be completed in the early part of Year 2. These data will help inform implementation practices, and lead to development of the next steps to ensure good engagement of SVS with industry stakeholders and growers.

The field team have taken video and photos as they undertake trial work. They are working on communication of these resources and will connect with the Workstream 4 group regarding communication pathways.

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