| DATA SCIENCE | LINLEY JESSON |
| --- | --- |
| Outcome More sustainable and profitable systems. Impact Indicators  * Maintained and/or increased crop volumes, value and profitability * New Zealand’s productive environments sustained or enhanced, generating products with verifiable reduced footprints to maintain and/or increase market access.  Science Targets  * Whole systems modeling and prediction platform * Tools developed for eco-verification, footprinting and traceability (water, carbon, greenhouse gases, soil, biodiversity, pesticides, social equity) * Improved production technologies and cultivars based on scaled up knowledge from molecular, physiological, soil, water and environmental science, integrated with system science.  Impact Highlight Members of the Data Applications team have successfully applied computer vision algorithms to two problems: detecting and counting kiwifruit on the vine, and insects on sticky traps. These projects automate activities which are otherwise performed manually. This saves time and money, and allows larger quantities of data to be collected accurately. Interest in computer vision is increasing within PFR and from commercial partners such as Zespri and the seafood industry. Projects such as these help us build capabilities for PFR’s Growing Futures and Technology Development objectives.  C:\Users\cfllkj\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\T7I0C4PA\Fly-pred.PNGC:\Users\cfllkj\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\T7I0C4PA\kiwi-pred.png  Fig. 1. Predicted assignment of A) insects on sticky-traps and B) kiwifruit on vines using machine-learning computer vision algorthms. OutputsPeer-Reviewed Publications  * Ashton, D. T., Hilario, E., Jaksons, P., Ritchie, P. A., & Wellenreuther, M. (2019). Genetic diversity and heritability of economically important traits in captive Australasian snapper (Chrysophrys auratus). *Aquaculture*, *505*, 190-198. * Cook, D., Middlemiss, K., Jaksons, P., Davison, W., & Jerrett, A. (2019). Validation of fish length estimations from a high frequency multi-beam sonar (ARIS) and its utilisation as a field-based measurement technique. *Fisheries Research*, *218*, 59-68. * Kiliana Bekelaar, Tania Waghorn, Michael Tavendale, Catherine McKenzie, Dave Leathwick. “Abomasal nematode species differ in their in vitro response to exsheathment triggers”. *Parasitology Research 118(2),* January 2019 <https://doi.org/10.1007/s00436-018-6183-1> * Eady SL, Wallace AJ, Butts CA, Hedderley D, Drummond L, Ansell J, Gearry RB. 2019. The effect of ‘Zesy002’ kiwifruit (Actinidia chinensis var. chinensis) on gut health function: a randomised cross-over clinical trial. Journal of Nutritional Science, 8 (2019), https://doi.org/10.1017/jns.2019.14 * Harker R, Hunter D, White A, Richards K, Hall M, Fullerton C. 2019. Measuring changes in consumer satisfaction associated with kiwifruit ripening: A new approach to understand human-product interactions with fruit. Postharvest Biology and Technology, 153 (2019): 118-124. * Hunter DC, Jones VS, Hedderley DI, Jaeger SR. 2019. The influence of claims of appetite control benefits in those trying to lose or maintain weight: The role of claim believability and attitudes to functional foods. Food Research International, 119 (2019): 715-724, <https://doi.org/10.1016/j.foodres.2018.10.051> * Kim EHJ, Paredes D, Motoi L, Eckert M, Wadamori Y, Tartaglia J, Green C, Hedderley DI, Morgenstern MP. 2019. Dynamic flavor perception of encapsulated flavors in a soft chewable matrix. Food Research International, 123 (2019): 241-250, https://doi.org/10.1016/j.foodres.2019.04.038   Stringer, L.D., Soopaya, R., Butler, R.C., Vargas, R.I., Souder, S.K., Jessup, A.J., Woods, B., Cook, P.J. & Suckling, D.M. 2019. Effect of Lure Combination on Fruit Fly Surveillance Sensitivity. Scientific Reports 9:2653, 11. Published online 25/2/2019/ DOI: 10.1038/s41598-018-37487-6  Nielsen, M.-C., Sansom, C.E., Larsen, L., Worner, S.P., Rostás, M., Chapman, R.B., Butler, R.C., de Kogel, W.J., Davidson, M.M., Perry, N.B. & Teulon, D.A.J. 2019. Volatile compounds as insect lures: factors affecting release from passive dispenser systems. New Zealand Journal of Crop & Horticultural Research, 17. Published online 28/4/2019/ DOI: 10.1080/01140671.2019.1604554  Christina F. Butowski, David G. Thomas , Wayne Young, Nick J. Cave , Catherine M. McKenzieI , Douglas I. RosendaleI , Emma N. Bermingham. “Addition of plant dietary fibre to a raw red meat high protein, high fat diet, alters the faecal bacteriome and organic acid profiles of the domestic cat (Felis catus)”. . PLoS ONE 14(5): e0216072. [https://doi.org/10.1371/journal. pone.0216072](https://doi.org/10.1371/journal.%20pone.0216072) Client Reports  * Alavi M, Wohlers M, Richards K, Burdon J. March 2019. FP1921: Storage breakdown disorder prediction in ‘Hayward’ and Gold3 kiwifruit. A Plant & Food Research Client Report prepared for Zespri Group Ltd. SPTS No. 17651. * Logan D, McKenna C, Herrick J, Rogers P, Dobson S, Morales-Rodriguez A, Rowe C, McKenzie C, Richards K. February 2019. CP1858: Development of an IPM plan for greenhouse thrips. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 75890. Contract No. 35324. Job code: P/310116/01. SPTS No. 17471. * McKenna C, Mauchline N, Dobson S, Rogers P, Dent S, Herrick J, Theodore M, Stirling J, McKenzie C. March 2019. Evaluation of Sero-X insecticide against key horticultural pests: greenhouse thrips, passionvine hopper and armoured scale insects. A Plant Food Research report prepared for: GroChem. Milestone No. 76684. Contract No. 35342. Job code: P/342074/03. SPTS No. 17603. * Olsson S, Ansorge J, Blattmann M, Martin P, Barnett A, Shahjahan K, Hoyte S, Mckenzie C, Currie M. March 2019. NP1869: Risk mitigation for R019 commercialisation on-orchard 2018. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 76381 . Contract No. 35723. Job code: P/415869/01. SPTS No. 17608. * Perie E, Barnett A, Blattmann M, Bird J, Astill M, Jesson L, Hoeata K, Thorp G, McKenzie C. March 2019. NT1725: Kiwifruit rootstock stages 2 and 3 evaluation, 2016-2018. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 70648. Contract No. 33999. Job code: P/415725/01. SPTS No. 17512. * Currie M, Martin P, Olsson S, Ansorge J, Blattmann M, Roberts H, Astill M, Bird J, Seymour S, Shirtliffe A, Hunter D, Duffy A, Burdon J, Pidakala P, McKenzie C.. March 2019. NT1902: Stage 2 clonal trials — final report 2018. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 76401. Contract No. 35522. Job code: P/415902/01. SPTS No. 17635 * Wilkinson RT, Redpath SP, Cho J, Woolf AB, Jamieson LE, Page-Weir NEM, Hawthorne AJ, Hartnett DE, Guo LF. February 2019. Refining controlled atmosphere temperature treatment system (CATTS) for New Zealand apples and its effects on codling moth (Cydia pomonella) mortality and apple quality. A Plant & Food Research report prepared for: New Zealand Apple & Pear Inc. & MBIE. Milestone No. 76659. Contract No. 35305. Job code: P/331064/01. SPTS No. 17515. * Jinping ZHANG, Qianqian MI, Juhong CHEN, Gonzalo AVILA, Lindy Guo, Feng ZHANG. 11 December 2018. BMSB Control with Autumn Trap-Milestone Report (GO1958-77-A): Trap efficiency assessment. A CABI (Centre for Agriculture and Biosciences International) report prepared for: New Zealand Plant & Food Research. PFR job code: P/310121/01. * Jinping ZHANG, Juhong CHEN, Qianqian MI, Gonzalo AVILA, Lindy GUO, Manoharie SANDANAYAKA, Rui TANG, Feng ZHANG. 3 Jan 2019. BMSB impacts and phenology on kiwifruit and associated parasitoids – six month report to PFR (project No.35894). A CABI (Centre for Agriculture and Biosciences International) report prepared for: New Zealand Plant & Food Research. PFR job code: P/310121/01. * Walter, M., Turner, L., Vorster, L., Butler, R. & Smith, J. 2019. DMI efficacy and residues for black spot control in apple. Plant & Food Research Client Report No SPTS No. 17652. 18 p * Kramer-Walter K, Snelgar P, McKenzie C, Blattmann P, Kramer M. April 2019. GP1953: Optimising the application of Hi-Cane® to sustainably maximise kiwifruit crop yields. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 79119. Contract No. 36131. Job code: P/415953/01. SPTS No. 17706. * Kabir MS, Everett K, Ospina-Lopez A, Parry B, McBrydie HM, Broussard M, Felman C, Janke M, McKenzie C. April 2019. VI1928: Kiwifruit pollen treatment. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 77215. Contract No. 35803. Job code: P/310124/01. SPTS No. 17781.  Presentations Given at International or National Conferences or Meetings  * Claudia Lang, B Warren, M Wohlers, J Ingram. A randomized, controlled, cross-over clinical study investigating the bioavailability of dietary fruit microRNAs (miRNAs) in humans. Keystone Symposia on Molecular and Cellular Biology, Small Regulatory RNAs (D7). Daejon, South Korea, 14-18 April 2019. * Carmel Woods and Matthew Laurenson hosted a one-day CRI Data Managers meeting at Lincoln, 28 March 2019. At least one representative from each CRI attended, and talks were given by Paul Stone (StatsNZ) on the NZ Open Data Programme, Mary-Ellen Gordon (VIC) on Measuring Organisational Data Capabilities and Andrew Watkins (consultant to PFR) on the Data Registry Project.  Professional Development | |
|  | |