| DATA SCIENCE | LINLEY JESSON  ADD NAME OF BUSINESS MANAGER/S |
| --- | --- |
| 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 The Data Science group is helping PFR to increase its efficiency in handling, managing and exploring data in many ways. To promote a culture of Data Science in the company the group hosted a Data Science Forum - "Everyone a Data Scientist". Over 60 PFR staff attended the two-day event at Lincoln on September 5th and 6th. The meeting started with a discussion on leadership from Roger Robson-Williams about creating a Data Science culture in PFR. Guest speaker Kim Lung Chan, head of Data Science at the Callaghan Institute discussed opportunities for funding for students, research projects and businesses in Data Science and opportunities for increased collaboration between the two institutions. We then had a series of rapid fire talks with themes ranging from Data Management, Statistics, High Performance Computing and New Technologies.  The second day ended with a discussion on "How to Solve Our Data Pain Points". These “pain points” included increased automatic data handling and reporting, solutions for long-term data storage, and better data literacy among staff. Many of the solutions revolved around:   1. building a strong and connected Data Science community that regularly engages in training, 2. increasing the numbers of data literate staff, and 3. the importance of metadata (data about data) and consistent formats and descriptors for understanding and sharing data.   These discussions help promote a culture of data science at Plant and Food Research, so that our data is *Findable*, *Accessible*, *Interoperable* and *Reusable* (FAIR). In the long-term increased uptake of data science practices will enable more efficient data capture, handling and processing which can only boost productivity for PFR. OutputsPeer-reviewed Publications Bell VA, Hedderley DI, Pietersen G, Lester PJ 2018. Vineyard-wide control of grapevine leafroll-associated virus 3 requires an integrated response. J Plant Pathol (2018). <https://doi.org/10.1007/s42161-018-0085-z>  Butts CA, Hedderley DI, Herath TD, Paturi G, Glyn-Jones S, Wiens F, Stahl B, Gopal P (2018) Human milk composition and dietary intakes of breastfeeding women of different ethnicity from the Manawatu-Wanganui region of New Zealand. Nutrients 2018, 10, 1231; doi:10.3390/nu10091231  Jamieson, L., Wilkinson, R., Page-Weir, N., Hawthorne, A., Hartnett, D., Redpath, S., Chhagan, A., Woolf, A., Nangul, A., & Guo, L. (2018). Assessing the efficacy of controlled atmosphere temperature treatment system (CATTS) against codling moth inside harvested apples. New Zealand Plant Protection, 71, 306-313. <https://doi.org/https://doi.org/10.30843/nzpp.2018.71.151>  Mathew L, McLachlan A, Jibran R, Burritt DJ, Pathirana R 2018. Cold, antioxidant and osmotic pre-treatments maintain the structural integrity of meristematic cells and improve plant regeneration in cryopreserved kiwifruit shoot tips. Protoplasma 255(4): 1065-1077.  Norris M, Johnstone PR, Dexter MM, Selbie DR, Houlbrooke DJ, Sharp JM, Hedderley DI 2018. Predicting nitrogen supply from dairy effluent applied to contrasting soil types. New Zealand Journal of Agricultural Research , <https://doi.org/10.1080/00288233.2018.1508478>  Page-Weir, N., Jamieson, L., Hawthorne, A., Wilkinson, R., Hartnett, D., Redpath, S., Chhagan, A., Woolf, A., & Guo, L. (2018). Effect of various heat treatments to target apple leafcurling midge (Dasineura mali) cocoons on apples. New Zealand Plant Protection, 71. <https://doi.org/https://doi.org/10.30843/nzpp.2018.71.150>  Scheper RWA, Fisher BM Taylor T, Hedderley D 2018. Detached shoot treatments cannot replace wholetree assays when phenotyping for apple resistance to Neonectria ditissima. New Zealand Plant Protection 71: 151-157 (2018) <https://doi.org/10.30843/nzpp.2018.71.137>  Chase, K.D., Stringer, L.D., Butler, R.C., Liebhold, A.M., Miller, D.R., Shearer, P.W. & Brockerhoff, E.G. 2018. Multiple-Lure Surveillance Trapping for *Ips* Bark Beetles, *Monochamus* Longhorn Beetles, and *Halyomorpha halys* (Hemiptera: Pentatomidae). *Journal of Economic Entomology*.  Howlett, B.G., Butler, R.C., Walker, M.K. & Teulon, D.A.J. 2018. Are insect flower visitor assemblages distinguishable between *Brassica napus* and *B. rapa*? *New Zealand Plant Protection* 71, 189-197.  Kean, A.M., Nielsen, M.-C., Davidson, M.M., Butler, R.C. & Vereijssen, J. 2018. Host plant influences establishment and performance of *Amblydromalus limonicus*, a predator for *Bactericera cockerelli*. *Pest Managment Science*.  Orchard, S., Campbell, R., Turner, L., Butler, R., Curnow, T., Patrick, E. & Walter, M. 2018. Long-term deep-freeze storage of Neonectria ditissima conidium suspensions does not reduce their viability to infect apple trees. *New Zealand Plant Protection* 71, 158-165.  Thalwitzer, L., Kelly, D., Smissen, R.D., Butler, R., Suckling, D.M. & El-Sayed, A. 2018. Species-specific male pollinators found for three native New Zealand greenhood orchids (Pterostylis spp.) suggest pollination by sexual deception. *Australian Journal of Botany* 66(3), 243-254.  Cook, Denham G., Peter Jaksons, and Alistair R. Jerrett. "Tagging investigations with small estuarine-associated fish: tag evaluation, capture methodologies and assessment of capture stress and survival in yellow-eyed mullet Aldrichetta forsteri." Marine and Freshwater Research.  Bicknell, Ross, and Peter Jaksons. "Floral phenology and floral induction in Leptospermum scoparium." New Zealand Journal of Botany (2018): 1-13.  Ron Beatson, Peter Jaksons; Kerry Templeton. 2018, Wellington. Hops with a difference. International Brewing and Distilling Conference proceeding.  Ah Chee, A., George, M., Alavi, M., & Wurms, K. (2018). Lipid-based bio-fungicides for control of powdery mildew in cucurbits. *New Zealand Plant Protection*, *71*, 262-271. <https://doi.org/10.30843/nzpp.2018.71.123> Client Reports Bell VA, Avila G, Burgess EPJ, Chhagan A, Cole L, Davis V, Hall A, Hedderley D, Malone L, Sandanayaka M, Taylor T 2018. Vineyard Ecosystems RA 1.2 Annual Report – Relating under-vine management, biota and leafroll virus. SPTS No. 16659 for: New Zealand Winegrowers  Chhagan A, Page-Weir NEM, Astill M, Horrocks K, Guo L, Poulton J, Hartnett D, Bird J, Power M, Jamieson LE. August 2018. Testing the efficacy of insecticides against citrus flower moth (CFM) in a small-plot field trial – Final report. A Plant and Food Research report prepared for: New Zealand Citrus Growers Incorporated. Milestone No. 74515. Contract No. 35076. Job code: P/337000/01. SPTS No. 16818.  Chng, S., Warren, R., Thompson, S. & Butler, R.C. 2018. SFF Ramularia Year 1 - Milestone 1 reporting. Plant & Food Research Confidential Report No SPTS No. 16955. 5 p  Chooi K, Hill G, Wohlers M, Lewis K. September 2018. Enhanced disease detection - Wine SSIF Annual Report. Milestone # 70088, SPTS number 16932.  Colhoun K, Redpath S, Wilkinson R, Attfield B, Scofield C, Guo L. June 2018. Extending the use of VAPORMATE™ to disinfest export apricots. A Plant and Food Research report prepared for: Summerfruit New Zealand. Milestone No. 75659. Contract No. 35078. Job code: P/336068/01. SPTS No. 16511.  Furlong, J., Dohmen-Vereijssen, J., Butler, R., Sinton, S., Michele, A., Dellow, S. & Shah, F. 2018. Potato Seed Tuber Health: Monitoring Tomato Potato Psyllid and Zebra Chip Disease in Mother and Daughter Crops. Plant & Food Research Confidential Report No SPTS No.16571. 41 p  Greven M, Arnold N, Bell V, Blouin A, Clothier B, Cole L, Cosic J, Fedrizzi B, Gentile R, Giraldo-Perez P, Goddard M, Grab F, Green S, Jesson L, Klaere S, Liu F, Mason K, Mundy D, Raw V, Sorensen I, Taylor T, Topal T, van den Dijssel C, Vanga B, Wood P, Woolley B, MacDiarmid R. 31 August 2018. Vineyard Ecosystems RA 1.1 Annual Report . A Plant and Food Research report prepared for: New Zealand Winegrowers. Milestone No. 65222. Contract No. 32476. Job code: P/335079/01. SPTS No. 16694.  Hall A, McKenzie C, Kramer-Walter K. August 2018. KiwiStart growth curves update 2018. A Plant Food Research report prepared for: Zespri Group Limited. Milestone No. 78572. Contract No. 35988. Jobcode: P/421033/01. SPTS No. 16773.  Hunter DC, White A, Clark C, Fullerton C, Cho J, Duffy A, Wohlers M, Auld M, de Lapparent C, Baker A, Magni C, Krone K, Chow M, Harker FR. July 2018. NP1903 Objective 3c1: Red19 Taste (Minimum Taste Standard) study. A Plant and Food Research report prepared for: Zespri Group Limited. Milestone No. 77684. Contract No. N/A. Job code: P/262063/07. SPTS No. 16651  Jesson L, Kramer-Walter K, Gould N. August 2018. GP1854: Data mining for factors that influence the variability in kiwifruit fruit quality. A Plant and Food Research report prepared for: Zespri Group Limited. Milestone No. 77106. Contract No. 35722. Job code: P/415854/01. SPTS No. 16841  Kim E, Motoi L, Wadamori Y, Wade C, Hedderley D, Morgenstern M 2018. Impact of Intensates® flavor concentrations on flavor perception and flavor lastingness. SPTS No. 16518 for Takasago International Corporation (USA)  McCulloch J, Sinton S, Shah F, Richards K. August 2018. P17-05: The effects of formaldehyde potato seed treatment on plant health and yield. A Plant and Food report prepared for Foundation for Arable Research, SPTS No. 16733.  McKenna C, Dobson S, Rogers P, Herrick J, McKenzie C. August 2018. CP1866: Scale insect control on Gold3 kiwifruit crops. A Plant and Food Research report prepared for: Zespri Group Limited. Milestone No. 76178. Contract No. 35326. Job code: P/310117/01. SPTS No. 16872.  Norris M, Hunt A, Dellow S, Arnold N, Liu J, Sorensen I, Tan Y, Hedderley D 2018. Nitrogen — Measure it and manage it: Year 2 summary report. SPTS No. 16566 for FAR  Paturi G, Butts CA, Stoklosinski H, Martell S, Hedderley D 2018. Establishment of antibiotic-induced intestinal dysbiosis in newly weaned rats. SPTS No. 16368 for Dairy Goat Co-operative (NZ) Ltd  Pineau B, Beresford MK, Grose C, Albright A, Richards K, Jaeger SR. June 2018, Sensory characterisation of within-brand pairs of commercial Lighter and full-strength New Zealand Sauvignon blanc wines. A Plant and Food report prepared for New Zealand Winegrowers, SPTS 16457.  Reglinski T, Cooney J, Jensen D, Vanneste JL, Yu J, Cornish D, Taylor J, Ah Chee A, Boldingh H, Jonson H, Pereira T, McGhie T, Rowan D, Alavi M, Hedderley D 2018. VI1602 Evaluating the use of elicitors to induce resistance to Psa in Gold3 kiwifruit. SPTS No. 16565 for Zespri Group  Reglinski T, Gould N, Wurms K, Anderson R, Haisman N, Taylor J, AhChee A, Snelgar P, Alavi M (2018), Effect of light quality on defence elicitation and growth for Zespri, SPTS No. 16924  Seal, A, Peter Jaksons, Peter McAtee, Megan Woods, Jeremy Meikle, Natalie Taufa. Does the use of different males for pollination affect important fruit characteristics of Red019? (PFR Report)  Sinton S, Dellow S, Shah F, Richards K, Michel A, Linton J. June 2018. P15-01: Increasing potato yield through understanding the impacts of crop rotations and soil compaction – Year 3. A Plant and Food report prepared for Foundation for Arable Research, SPTS No. 16363.  Summers G, Fletcher GC, Hedderley D, Black S. August 2018. Effect of fishing technique on quality indicators in whole snapper stored on ice: a comparison of the Modular Harvesting System and commercial mesh trawl. SPTS No. 16731 for Precision Seafood Harvesting Limited.  Sullivan, N.J., Bell, V.A., Butler, R., Wallis, R., Twidle, A.M., Bunn, B., Manning, L.M. & Suckling, D.M. 2018. The longtailed mealybug (Pseudococcus longispinus) synthetic sex pheromone: developing a monitoring tool for a vineyard pest. Plant & Food Research Confidential Report No SPTS No. 16835. 20 p  Thorp G, Smith A, Coates M, Hedderley D, Wirthensohn M. 2018. Tree Architecture and Development of New Growing Systems. SPTS No. 16739 for Almond Board of California.  Wilson A, Motoi L, Wadamori Y, Wade C, Munro C, Larsen N, Hedderley D. 2018. Comparison of Perten doughLAB mixer with PFR 125 g MDD mixer – commercial and cultivar trials. SPTS No. 16663 for Flour Millers Research Trust.  Wurms K, AhChee A, Anderson R, Copedo J, Zavodna M, Alavi M, Reglinski T, Hoyte S, Elmer P (2018), Novel molecular screening of promising biocontrol agents (BCAs) for Zespri, SPTS No. 16926 Invitations to participate on Editorial BoardsInvitations to Boards of other Journals M Wohlers received an invitation to be part of the editorial board for the 9th International Postharvest Symposium to be held in Rotorua November 2020. The reviewed and edited papers will be published in *Acta Horticulturae*. Presentations given at International or National Conferences or MeetingsInternational Presentations Sullivan, T.E.S., Park, K.C., Butler, R., Taylor, P.J. & Suckling, D.M. 2018. Acoustic communication and mating behaviour in the tomato potato psyllid, Bactericera cockerelli (Sulc). *2nd International Symposium on Biotremology*., Riva del Garda, Italy, 4-6 September 2018  Woolf A, Nangul A, Sanxter S, Sandra S, Postler M, Hall M, Redpath S, Wall M, Follett PA, Waddell B, Richards K, Wohlers M, and Jamieson L. Can X-rays disinfest temperate pests in apples? Eighth Annual Chapman Phytosanitary Irradiation Forum. June 14-15, 2018, Bangkok, Thailand.  Wohlers, W. (2018, July). DEEP LEARNING WITH KERAS R TO MODEL SPECTRAL DATA. Paper presented at the useR! 2018 The Conference for Users of R, Brisbane, Australia. (Presented) | |