

Curriculum Vitae

Dr Peter William CLINTON

Science Leader, Forest Systems

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Academic qualifications

1991	PhD Forestry (University of Canterbury)
1987	MSc (1st class Honours) Botany (University of Canterbury)
1983	BSc Botany (University of Canterbury)

Awards, honours, editorships, distinctions or other indicators of peer esteem

- 2018 invited keynote address, 13th North American forest soils conference – Soils-Forests interactions in changing environments
- 2016–present Professor (Adjunct), School of Forestry, University of Canterbury
- Invited Guest Editor Journal of Soil and Sediments v17
- Invited Special Editor of the special issue of Canadian Journal of Forest Research v 46, 2016. Quantifying uncertainty in forest measurements and models: approached and applications
- 2015 Invited Keynote speaker and member of organising committee for the International Symposium on Forest Soils: Linking Soil Processes to Forest Productivity and Water Protection under Global Change (ISFS 2015), 24–28 October 2015, Fuzhou
- 2014 Awarded Scion’s CEO prize for an outstanding career with Scion
- 2014 Invited Science reviewer for Balance Agrinutrients Clear view PGP by MPI
- 2014 Co Chair sub plenary Session (SP-07) The importance of quantifying uncertainty in managing forests. IUFRO World Congress, Salt Lake City
- 2014 Co Chair of technical session E-02b, Environmental impacts of intensive management of forest soils for timber and bioenergy production. IUFRO World Congress, Salt Lake City
- 2014 Invited presenter, Forest Productivity Cooperative, annual meeting Atlanta, 14–18 October 2014
- 2014 Invited reviewer for the Australian Research Council
- 2013 Invited Co-chair International symposium on Forest Soils: linking ecosystem processes and management to forest biodiversity and Functions, 17–20 September 2013, Shenyang, China
- 2012 Invited panellist Environment Defence Society annual conference session “*What are the opportunities to green forestry production*”, Auckland, 6 August

- 2010 Invited participant in panel discussion for New Zealand Ecological Society Conference Symposium on Biodiversity and Production Lands: the Benefits and the Risks. Dunedin, 25 November 2010
- 2010 Invited participant in panel discussion on experimental designs for addressing climate change required research. XXIII IUFRO World Congress, Forests for the Future: Sustaining Society and the Environment, 23–28 August 2010, Seoul, Republic of Korea
- 2009 Invited Associate Editor New Zealand Journal of Forestry Science
- 2009 Invited Co-chair 13 World Forestry Congress, Argentina, Congress declaration drafting committee
- 2007 Scientific advisory committee for the International Symposium on Forest Soils and Ecosystem Health: Linking Local Management to Global Challenges, 19–23 August 2007, Noosa, Sunshine Coast, Queensland, Australia
- 2007 Invited Adjunct Senior Fellow, School of Forestry, University of Canterbury
- 2007 Invited presenter, International workshop on Soil Plant Microbe Interactions and Plant Health, National Centre for Advanced Bio-protection Technologies, Lincoln University, 11–12 April 2007
- 2005–14 Invited chair IUFRO division 8 forest soils working group
- 2004 Invited chair, Residue recycling, IUSS/IUFRO conference, forest soils under global and local change, Bordeaux
- 2003–05 Research Advisory Committee, School of Forestry, University of Canterbury
- 2002 OECD Fellowship, Biological Resource Management for Sustainable Agriculture
- 2002 French Foreign Ministry Fellowship, Sustainable Forest Management in France
- 1999–2003 New Zealand representative on International Energy Agency Activity “Task 18: Conventional forestry systems for Bioenergy”
- 1995- Member New Zealand Institute of Forestry
- 1994 Invited Country Reviewer IPCC WG1 report
- 1993 Invited chair, Management implications of soil carbon in site productivity at Eight North American Forest Soils conference on carbon: form and function in forest soils
- 1991 Frank E. Hutchinson Prize, New Zealand Institute of Forestry, excellence in postgraduate study
- 1987 Owen Browning Scholarship for study in Forestry, University of Canterbury
- 1987 Postgraduate Study Award, New Zealand Forest Service
- Regular reviewer for Forest Ecology and Management, Soil Biology and Biochemistry, New Zealand Journal of Agricultural Research, New Zealand Journal of Forest Science
- Occasional reviewer for Tree Physiology, Canadian Journal of Forest Research, Journal of New Zealand Royal Society, Journal of Forestry. Journal of Soils and Sediments

Professional experience

2013–	Science Leader Forest Systems
2013–	Science Leader MBIE Program “Growing Confidence in Future Forests”
2011–13	Science Leader Forest environment and economics
2008–11	Team Leader Environmental Vitality
2005–13	Science Leader FRST Program “Forestry and Environment”
2007–09	Science Leader FRST Program “Waste to Resources”
2004–08	Program Manager New Zealand Forest Site Management Cooperative
2003–08	Group Leader, Long-term Site Productivity
2000–02	Senior Scientist, Sustainable Forest Management, Forest Research
1992–2000	Scientist, NZ Forest Research Institute Ltd, Forest Ecology and Management
1990–92	Scientist, Forest and Wildlands Ecosystem Centre, Forest Research Institute
1987–90	New Zealand Forest Service Postgraduate study award

My linkedin profile <http://nz.linkedin.com/pub/peter-clinton/37/130/b8>

Research interests

I have broad experience in the management and ecology of both exotic and natural forest ecosystems. My research has focused on carbon and nutrient dynamics and plant soil interactions. I have applied stable isotopes to examine issues such as the environmental fate of nitrogen fertilisers, competitive interactions between plant species and the fundamental nature of soil organic nitrogen. I have applied new knowledge of nutrient cycling to better understand natural stand development sequences, which has clarified the role of deadwood in natural and managed indigenous forests. Amongst my diverse areas of research are studies on water use by trees, the biogeochemistry of natural forests, impacts of forest management and the effects of wastewater on microbial communities. My current research concentrates on ways forest management practices affect soil biophysical properties and processes that control soil and forest productivity. I have overseen the development and application of advanced molecular techniques for the study of New Zealand’s forest soils.

I have promoted the need to better understand important interactions between tree genotypes and their environment. I have also led research on plant-soil interactions for species other than Radiata pine to increase our ability to better match species with their preferred sites for growth. This has resulted in several long-term trials being established and continuing to be maintained.

Research experience

I have spent nearly 30 years working in both indigenous and exotic forests of New Zealand. During that time I gained my PhD from the University of Canterbury and have published over 100 refereed papers. I have led the Government-funded national program on Sustainable Forest Management, which has provided core capability to support the sustainable management of New Zealand planted forests since 2005. I now lead the Forest System's team at Scion and am responsible for the MBIE/forest growers levy trust-funded research program "Growing Confidence in Forestry's future". This is one of the largest Government-funded research programs in New Zealand and the largest research program funded by the New Zealand forest Industry. Until very recently, I was the co-ordinator of the International Union of Forest Research Organisations' working group on Forest Soils. As the Program Manager of the New Zealand Forest Site Management Cooperative from 2004 until the formation of Future Forests Research Ltd in 2008 I was exposed to a wide variety of environmental issues and research concerns facing the forestry and rural land use sectors. I was also the National Team Leader for the International Energy Agency Bioenergy task for 4 years until 2003 and I have maintained several collaborations with members of this group. I was awarded an OECD fellowship in 2002 to study sustainable forest management issues in Europe and developed research collaborations that have grown into wider collaborations and exchanges with INRA scientists and several forest system colleagues, for example Jean-Christophe Domec has been a collaborator with Jianming Xue and a Scion-funded Postdoc.

Teaching experience and building capacity

I have supported the development of new capability through the supervision of postgraduate students. I have contributed as the supervisor or co-supervisor to the development of more than 30 postgraduate students. I have supervised 13 completed PhDs, 12 completed Masters of Science and 4 postdoctoral fellows. I have greatly contributed to their development as productive scientists in a range of fields, with several now holding key appointments. Several of the postgraduate students I have worked with now have key roles within Scion. I have been a regular supervisor of research interns from Les Grande Écoles of France. I have been the invited external examiner for 7 PhDs and 4 Masters of Science. I have also given quest lectures from time to time in the School of Forestry on my research into sustainable management of forest soils.

Full Publications List

Summary of science quality metrics

Number of refereed publications >100

5 book chapters

Google Scholar H 28, i10 index 61 2655 Citations

Research gate 37.09, in top 5% of research gate members

Scopus H factor 23
Life time citations >1800

Theses

Clinton, P.W. 1991. Competition for nitrogen and moisture in a *Pinus radiata* – pasture agroforestry system. PhD thesis, School of Forestry, University of Canterbury.

Clinton, P.W. 1987. Biomass, productivity, and nutrient stocks of fine roots of 15-year-old *Pinus radiata* and mixed-aged *Nothofagus truncata* forests of North-west Nelson. MSc thesis, University of Canterbury.

Books, Book Chapters, Monographs

1. **Clinton, P.W.**; Richardson, B.; Horner, M. 2011. Benefits of sustainable forest Management. In Forests for People. Tudor Rose and United Nations Forum on Forests Secretariat. For the International Year of Forests 2011. Pp. 150–153.
2. Condrón, L.M.; Stark, C.H.E.; O’Callaghan, M.; **Clinton, P.W.**; Zhigun, H. 2010. The role of microbial communities in the formation and decomposition of soil organic matter. In: Soil microbiology and sustainable crop production. Dixon, G.R.; Tilston, E.L. (ed.) Springer-Verlag, Dordrecht. Pp. 81–118.
3. Bradley, J.; Horswell, J.; **Clinton, P.W.**; Schruer, M.; Morris, G.; Wilson, A. 2009. New Zealand. In: LeBlanc, R.J.; Mathews, P.; Richard, R.P. (ed.) Global atlas of excreta, wastewater sludge and biosolids management: Moving forward the sustainable and welcome uses of a global resource. United Nations Human Settlements Programme. UN Habitat.
4. Davis, M.R.; Xue, J.; **Clinton, P.W.** 2010. Plantation Forest Nutrition. Scion bulletin
5. Magesan, G.N.; Wang, H.; **Clinton, P.W.** 2010. Best Management Practices for Applying Biosolids to Forest Plantations in New Zealand. ISBN 978-0-478-11033-2.

Refereed papers

1. **Clinton, P.W.** 2018. Future expectations of forest soils: increasing productivity within environmental limits using new knowledge. *New Zealand Journal of Agricultural Research* (in revision).
2. Khan, R.; Anderson, C.; Loganathan, P.; Xue, J.; **Clinton, P.W.** 2018. Response of Mycorrhizae and Soil dehydrogenase activity to Boron from slow released Boron fertilizer in *Pinus radiata*. Submitted to *Rhizosphere*.
3. Gallart, M.; Adair, K.; ; Love, J. Meason, D.F.; **Clinton, P.W.**; Xue, J.; Turnbull, M.H. Genotypic variation in *Pinus radiata* responses to nitrogen form are related to changes in the root microbiome. *FEMS Microbiology Ecology* (revised).
4. Gallart, M., Dean Meason, **P.W. Clinton**, Jianming Xue, Graham Coker; Paula Jameson, Jonathan Love, Matthew Turnbull 2018. Field-scale variability in site conditions and seasonal differences in climate explain genotypic variation in response to nitrogen source in *P. radiata* (D. Don). Submitted *forest ecology and management*.
5. Parker, R.; **Clinton, P.W.**; Bayne, K.; Hooper, B. 2018. Forestry automation and Robotics. *New Zealand Journal of Forestry* in press.
6. Pawson, S.M.; Kerr, J.; Bader, M.K-F.; **Clinton, P.W.** 2018. Saproxylic arthropods provide multiple ecosystem services. Submitted to *Ecological Applications*.
7. Rodriguez-Gamir, J.; Xue, J.; Clearwater, M.; Meason, D.F.; **Clinton, P.W.**; Domec, J.C. 2018. Coordination between whole plant hydraulic conductance and stomatal conductance in *Pinus radiata* through changes in root aquaporin activity under drought stress. Submitted to *Plant, Cell and Environment*.
8. Smail, S.J.; **Clinton, P.W.**; Greenfield, L.G. 2016. Biological indices of site productivity. Submitted to *Biology and Fertility of Soils*.
9. Xue, J.; Coker, G.; Davis, M.R.; **Clinton, P.W.** 2018. Long-term effects of boron fertiliser and weed control on foliar nutrition and growth of eight radiata pine genotypes grown at two contrasting sites in New Zealand. Submitted *forest ecology and management*.
10. Zhou, X.; Chengyun X.; Hosseini Bai, S.; Xu, Z.; Smail, S.J.; **Clinton, P.W.**; Chen, C. 2018. Manipulating the interaction between plant stress response and soil methane oxidation rates, *Soil Biology and Biochemistry* (in revision).
11. Gallart, M.; Adair, K.; Meason, D.F.; **Clinton, P.W.**; Xue, J.; Turnbull, M.H.; Love, J. 2018. Host genotype and nitrogen form shape the root microbiome of *Pinus radiata*. *Microbial Ecology* 75, 419–433.
12. Huang, Z; Chang, S., **Clinton, P.W.**; Johnson, C.E.; Wang, H. Xu, Z. Preface to the special issue for the 8th international symposium of Forest Soils: linking soil processes to Forest Productivity and water protection under global climate change. *Journal of soils and Sediments* 17; 2215-2217.
13. Parker, R.; Hooper, H.; **Clinton, P.W.** 2017. Animal inspiration. *Safeguard* 163, 51-52.
14. Parker, R.; Bayne, K.; **Clinton, P.W.** 2016. Robotics in Forestry. *New Zealand Journal of Forestry* 60, 8–14.

15. Smaill, S.J.; **Clinton, P.W.** 2016. An overview of the issues affecting fertiliser use in New Zealand's radiata pine forests. *New Zealand Journal of Forestry* 61, 11–16.
16. Garrett, L.G., Smaill, S.J., **Clinton, P.W.** 2015. Nutrient supply one rotation to the next. *New Zealand Journal of Forestry* 60, 16–20.
17. Moore, J.; **Clinton, P.W.** 2015. Enhancing the productivity of radiata pine forestry with environmental limits. *New Zealand Journal of Forestry* 60, 35–41.
18. Yongjun L.; Jianming, X.; **Clinton, P.W.**; Dungey H. 2015. Genetic parameters and clone by environment interaction for growth and foliar nutrient concentration in radiata pine on 14 widely diverse New Zealand sites. *Tree Genetics and Genomes* (DOI 10.1007/s11295-014-0830-1)
19. Smaill, S.J.; **Clinton, P.W.**; Allen, R.B.; Leckie, A.C.; Davis, M.R. 2014. Coarse soil can enhance the availability of nutrients from fine soil. *Journal of Plant Nutrition and Soil Science* 177, 848–850.
20. Smaill, S.; **Clinton, P.W.**; Allen, R.B.; Davis, M.R. 2014. New evidence indicates the coarse soil fraction is of greater relevance to plant nutrition than previously suggested. *Plant and Soil* 374, 371–379.
21. Smaill, S.J.; Bayne, K.M.; Coker, G.W.R.; Paul, T.S.H.; **Clinton, P.W.** 2014. The right tree for the job? Perceptions of species suitability for the provision of ecosystem services. *Environmental Management* 53, 783–799.
22. Zhou, X.; Dong, H.; Chen, C.; Smaill, S.; **Clinton, P.W.** 2014. Ethylene rather than dissolved organic carbon controls methane uptake in upland soils. *Global Change Biology* 20, 2379–2380.
23. Bown, H.E.; Mason, E.G.; Watt, M.S.; **Clinton, P.W.** 2013. A potential nutritional modifier for predicting primary productivity of *Pinus radiata* in New Zealand using a simplified radiation-use efficiency model. *Ciencia e Investigacion Agraria*, 361–374.
24. Greenfield, L.G.; Gregorich, E.G.; van Kessel, C.; Baldock, J.A.; Beare, M.H.; Billings, S.A.; **Clinton, P.W.**; Condrón, L.; Hill, S.; Hopkins, D.W.; Jansen, H.H. 2013. Acid hydrolysis to define a biologically-resistant pool is compromised by carbon loss and transformation. *Soil Biology and Biochemistry* 64, 122–126.
25. Hamonts, K.; Clough, T.J.; Stewart, A.; **Clinton, P.W.**; Richardson, A.E.; Wakelin, S.A.; O'Callaghan, M.; Condrón, L.M. 2013. Effect of nitrogen and waterlogging on denitrifier gene abundance, community structure and activity in the rhizosphere of wheat. *FEMS Microbiology Ecology* 83, 568–584.
26. Xue, J.; **Clinton, P.W.**; Leckie, A.; Graham, D. 2013. Magnesium fertiliser, weed control and clonal on wood stiffness of juvenile *Pinus radiata* at two contrasting sites. *Forest Ecology and Management* 306, 128–134.
27. Xue, J.; **Clinton, P.W.**; Davis, M.; Siddiqui, T.; Beets, P.N.; Leckie, A.C. 2013. Growth performance of improved radiata pine clones in relation to foliar nutrient concentrations and $\delta^{13}\text{C}$ on a New Zealand serpentine soil. *Journal of Plant Nutrition and Soil Science* 176, 724–733.
28. Zhou, X.; Smaill, S.J.; **Clinton, P.W.** 2013. Methane oxidation needs less stressed plants. *Trends in Plant Science* 18, 657–659.

29. Zhou, X.; Chen, C.; Wang, Y.; Smaill, S.; **Clinton, P.W.** 2013. Warming rather than increased precipitation increases soil recalcitrant organic carbon in a semiarid grassland after 6 years of treatments. *PLoS ONE* (8) 2 art no. e53761.
30. Bown, H.E.; **Clinton, P.W.**; Mason, E.G.; Watt, M.S. 2012. The influence of N and P supply and genotype on N remobilisation in containerized *Pinus radiata* plants. *Ciencia e Investigacion Agraria* 39, 505–520.
31. Khan, R.; Anderson, C.W.N.; Loganathan, P.; Xue, J.; **Clinton, P.W.** 2012. Response of *Pinus radiata* D. Don to boron fertilisation in a glasshouse study. *Communications in Soil Science and Plant Analysis*. 43, 1412–1426.
32. Payn, T.W.; Spence, H.; Barnard, T.; **Clinton, P.W.**; Charteris, P. 2012. Perspectives on forests and climate change in New Zealand. *New Zealand Journal of Forestry* 56, 18–23.
33. Toosi, E.R.; **Clinton, P.W.**; Beare, M.H.; Norton, D.A. 2012. Biodegradation of soluble organic matter as affected by land-use and soil depth. *Soil Science Society of America Journal* 76, 1667–1677.
34. Bown, H.E.; Watt, M.; **Clinton, P.W.**; Mason, E.G.; S. 2011. Soil C/N influences carbon flux and partitioning in control and fertilized mini-plots of *Pinus radiata* in New Zealand. *Ciencia e Investigacion Agraria* 38, 277–289.
35. Geilen, G.J.H.P.; **Clinton, P.W.**; Vanden Heuvel, M.R.; Kimberley, M.O.; Greenfield, L.G.; 2011. Influence of sewage and pharmaceuticals on soil microbial function. *Environmental Toxicology and Chemistry* 30, 1086–1095.
36. Huang, Z.; Condon, L.M.; Davis, M.R.; **Clinton, P.W.** 2011. Soil carbon pools, plant biomarkers and mean residence time after afforestation of grassland with three tree species. *Soil Biology and Biochemistry* 43, 1341–1349.
37. Huang, Z.; **Clinton, P.W.**; Baisden, W.T.; Davis, M.R. 2011. Long-term nitrogen additions increased surface soil carbon concentration in a forest plantation despite elevated decomposition. *Soil Biology and Biochemistry* 43, 302–307.
38. Huang, Z.; **Clinton, P.W.**; Davis, M.R. 2011. Post-harvest residue management effects on recalcitrant carbon pools and plant biomarkers within the soil heavy fraction in *Pinus radiata* plantations. *Soil Biology and Biochemistry* 43, 404–412.
39. Huang, Z.; **Clinton, P.W.**; Davis, M.R.; Yang, Y. 2011. Impacts of plantation forest management on soil organic matter quality. *Journal of Soils and sediments* 11, 1309–1316.
40. Magesan, G.N.; Wang, H.; **Clinton, P.W.**; McIntosh, J. 2012. Nitrogen cycling in gorse-dominated ecosystems in New Zealand – An overview. *New Zealand Journal of Ecology* 36, 21–36.
41. Smaill, S.J.; **Clinton, P.W.**; Allen, R.B.; Davis, M.R. 2011. Climate, resource supply and stand age interact to determine tree seed production. *Journal of Ecology* 99, 870–877.
42. Smaill, S.J.; **Clinton, P.W.**; Hock, B. 2011. A nutrient balance model (NuBalM) to predict biomass and nitrogen pools in *Pinus radiata* forests. *Forest Ecology and Management* 262, 270–277.

43. Bown, H.E.; Watt, M.; **Clinton, P.W.**; Mason, E.G.; S. 2010. Influence of ammonium and nitrate supply on growth, dry matter partitioning, N uptake and photosynthetic capacity of *Pinus radiata* seedlings. *Tree, structure and function* 24, 1097–1107.
44. Brandtberg, P.O.; Davis, M.R.; **Clinton, P.W.**; Condron, L.M.; Allen, R.A. 2010. Forms of soil phosphorus affected by stand development of mountain beech (*Nothofagus*) forests in New Zealand. *Geoderma* 157, 228–234.
45. Hawkins, B.; Xue, J.M.; Bown, H.; **Clinton, P.W.** 2010 Relating nutritional and physiological characteristics to growth of *Pinus radiata* clones planted on a range of sites in New Zealand. *Tree Physiology* 30(9), 1174–1191.
46. Smaill, S.J.; **Clinton, P.W.** Davis, M.R. 2010. Nitrogen fertiliser affects seed production in Mountain Beech. *Indigena*, 1–3.
47. Smaill, S.J.; **Clinton, P.W.**; Greenfield, L.G. 2010. Legacies of organic matter removal: decreased microbial biomass nitrogen and net N mineralization in New Zealand *Pinus radiata* plantations. *Biology and Fertility of Soils* 46, 309–316.
48. Smaill, S.J.; Leckie, A.C.; **Clinton, P.W.**; Hickson, A.C. 2010. Plantation management induces long-term alterations to bacterial phytohormone production and activity in bulk soil. *Applied Soil Ecology* 45, 30–34.
49. Bown, H.E.; Watt, M.S.; Whitehead, D.; Mason, E.G.; **Clinton, P.W.** 2009. The influence of N and P supply and genotype on carbon flux and partitioning in potted *Pinus radiata* plants. *Tree Physiology* 29, 857–868.
50. Bown, H.E.; Watt, M.S.; Mason, E.G.; **Clinton, P.W.**; Whitehead, D. 2009. The influence of nitrogen and phosphorus supply and genotype on mesophyll conductance limitations to photosynthesis in *Pinus radiata*. *Tree Physiology* 29, 1143–1151.
51. Bown, H.E.; Mason, E.G.; **Clinton, P.W.**; Watt, M.S. 2009. Chlorophyll fluorescence responses of *Pinus radiata* clones to nitrogen and phosphorus supplies. *Ciencia e Investigacion Agraria* 36, 451–464.
52. **Clinton, P.W.**; Buchanan, P.K.; Wilkie, J.P.; Smaill, S.J.; Kimberly, M.O. 2009. Decomposition of *Nothofagus* wood in vitro and nutrient mobilization by fungi. *Canadian Journal of Forest Research* 39, 2193–2202.
53. **Clinton, P.W.**; Phillips, C.J. Coker, R. 2009. Redwoods – what have we been waiting for? *New Zealand Tree Grower* 30, 3–5.
54. Geilen, G.J.H.P.; Vanden Heuvel, M.R.; **Clinton, P.W.**; Greenfield, L.G.; 2008. Factors impacting on pharmaceutical leaching following sewage application to land. *Chemosphere* 74, 537–542.
55. Hock, B.; Payn, T.; **Clinton, P.W.**; Turner, J. 2009. Towards green markets for New Zealand plantations. *New Zealand Journal of Forestry* 54, 9–19.
56. Richardson, S.J.; Peltzer, D.A.; Hurst, J.M.; Allen, R.B.; Bellingham, P.J.; Carswell, F.E.; **Clinton, P.W.**; Griffiths, A.D.; Wiser, S.K.; Wright, E.A. 2009. Deadwood in New Zealand's indigenous forests. *Forest Ecology and Management* 258, 2456–2466.

57. Ross, C.W.; Watt, M.S.; Parfitt, R.L.; Simcock, R.; Dando, J.; Coker, G.; **Clinton, P.W.**; Davis, M.R. 2009. Soil quality relationships with tree growth in exotic forests in New Zealand. *Forest Ecology and Management* 258, 2326–2334.
58. Smaill, S.J.; **Clinton, P.W.**; Allen, R.B. 2009. Inter-specific variation in foliar nutritional responses to disturbance by small coupe harvesting varies with 'landscape position. *Forest Ecology and Management* 258, 2382–2387.
59. Watt, M.S.; **Clinton, P.W.**; Parfitt, R.L.; Ross, C.; Coker, G. 2009. Modelling the influence of site and weed competition on juvenile modulus of elasticity in *Pinus radiata* across broad environmental gradients. *Forest Ecology and Management* 258, 1479–1488.
60. Holdaway, R.J.; Allen, R.B.; **Clinton P.W.**; Davis M.R.; Coomes D.A. 2008 Intraspecific changes in forest canopy allometries during self-thinning. *Functional Ecology* 22, 460–469.
61. Olykan, S.T.; Xue, J.; **Clinton, P.W.**; Skinner, M.F.; Graham, D.J.; Leckie, A.C. 2008. Effect of boron fertiliser, weed control and genotype on early survival, growth and nutrition of *Pinus radiata* D. Don on two contrasting sites. *Forest Ecology and Management* 255, 1196–1209.
62. Smaill, S.; **Clinton, P.W.**; Greenfield, L.G. 2008. Post-harvest organic matter removal effects on FH layer and mineral soil characteristics in four New Zealand *Pinus radiata* plantations. *Forest Ecology and Management* 256, 558–563.
63. Smaill, S.; **Clinton, P.W.**; Greenfield, L.G. 2008. Nitrogen fertiliser effects on litter fall, FH layer and mineral soil characteristics in New Zealand *Pinus radiata* plantations. *Forest Ecology and Management* 256, 564–569.
64. Wang, H.; Brown S.L.; Magesan, G.N.; Slade, A.H.; Quintern, M.; **Clinton, P.W.**; Payn, P.W. 2008. Technological options for the management of biosolids. *Environmental Science and Pollution Research* 15, 308–317.
65. Watt, M.S.; Davis, M.R.; **Clinton, P.W.**; Coker, G.; Ross, C.; Dando, J.; Parfitt, R.L.; Simcock, R. 2008. Identification of key soil indicators influencing plantation productivity and sustainability across a national trial series in New Zealand. *Forest Ecology and Management* 256, 180–190.
66. Watt, M.S.; D'Ath, R.; Leckie, A.C.; **Clinton, P.W.**; Coker, G.; Davis, M.R.; Simcock, R.; Parfitt, R.L.; Dando, J.; Mason, E.G. 2008. Modelling the influence of stand structural, edaphic and climatic influences on juvenile *Pinus radiata* fibre length. *Forest Ecology and Management* 254, 166–177.
67. Watt, M.S.; Kiyvyra, A.L.; **Clinton, P.W.**; Coker, G.; Parfitt, R.L.; Simcock, R.; Dando, J.; Davis, M.R.; Schoenholtz, S.H. 2008 Modelling water balance in fertilised and unfertilised *Cupressus lusitanica* and *Pinus radiata* grown across an environmental gradient. *Forest Ecology and Management* 255, 1104–1112.
68. Watt, M.S.; **Clinton, P.W.**; Coker, G.; Davis, M.R.; Simcock, R.; Parfitt, R.L.; Dando, J. 2008. Modelling the influence of environment and stand characteristics on wood density and modulus of elasticity for *Pinus radiata* and *Cupressus lusitanica*. *Forest Ecology and Management* 255, 1023–1033.

69. Beets, P.N.; Pearce, S.H.; Oliver, G.R.; **Clinton, P.W.** 2007. Root/shoot ratios for deriving the below ground biomass of *Pinus radiata* stands. *New Zealand Journal of Forestry Science* 37, 289–305.
70. Xue, J.M.; **Clinton, P.W.**; Sands, R.; Payn, T.W.; Skinner, M.F. 2008. Fate of biuret-¹⁵N and its effect on net mineralisation of native soil N in forest soils, *Australian Journal of Soil Research* 46, 636–644.
71. Bown, H.; Watt, M.S.; **Clinton, P.W.**; Mason, E.G.; Richardson, B. 2007. Partitioning concurrent influences of nitrogen and phosphorus supply on photosynthetic model parameters of *Pinus radiata*. *Tree Physiology* 27, 335–344.
72. Davis, M.R.; Coker, G.; Parfitt, R.; Simcock, R.; **Clinton, P.W.** Garrett, L.; Watt, M. 2007 Relationships between soil and foliar nutrients in young densely planted stands of *Pinus radiata* and *Cupressus lusitanica*. *Forest Ecology and Management* 240, 123–130.
73. Horswell, J.; Ambrose, V.; Clucas, L.; Leckie, A.C.; **Clinton, P.W.**; Speir, T. 2007. Survival of *Escherichia coli* and *Salmonella* spp. After application of sewage sludge to a *Pinus radiata* forest. *Journal of applied Microbiology* 103, 1321–1331.
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34. **Clinton, P.W.** 1995. Recommendations on nutritional management for some Otago forests. Confidential report, New Zealand Forest Research Institute, Rotorua.
35. **Clinton, P.W.**; Graham, J.D. 1994. Nutritional status of *Pinus radiata* in the Aorangi forests with an emphasis on boron and on magnesium. Confidential contract report. New Zealand Forest Research Institute, Ilam.
36. **Clinton, P.W.**; Skinner, M.F.; Fitzgerald, R.E. 1994. Nutritional management plan for *Pinus radiata* in Timberlands West Coast Ltd forests. Synthesis phase. Confidential contract report. New Zealand Forest Research Institute, Ilam.
37. **Clinton, P.W.**; Hunt, J.E.; Hollinger, D.Y.; McSeveny, T.M. 1992. Investigations of changes in forest carbon storage after logging native forests. Contract report for Ministry for the Environment. FWE 92/27.
38. **Clinton, P.W.**; Payn, T.A. 1992. Nutritional management plan for *P. radiata* in Wenita Forestry – City Forest's forests. Synthesis phase. Confidential contract report.

39. **Clinton, P.W.**; Nordmeyer, A.H. 1991. Container bombs for establishing plants on eroded lands. Final report for Priority Research Contract Scheme, FORST, Contract No. 90/75.
40. Graham, J.D.; Skinner, M.F.; **Clinton, P.W.** 1998. Comparison of nitrogen fertiliser and effects on the growth and nutrition of radiata pine. (1) Trial establishment at Woodhill and Kaingaroa Forests. Confidential Contract Report, NZFRI.
41. Olykan, S.T.; Graham, J.D.; **Clinton, P.W.** 1999. Growth and nutrition of radiata pine in the UMCY series A trial (FR190/10, Berwick forest) during 1998/99. Confidential contract report for Wentia Forest Products Ltd.
42. Olykan, S.T.; Graham, J.D.; **Clinton, P.W.** 1998. Installation report for the City Forests N*Mg trial, FR306, in Tokoiti Forest. Confidential contract report, NZFRI.
43. Olykan, S.T.; Graham, J.D.; **Clinton, P.W.** 1998. Installation report for the City Forests UMCY series C, FR190/9, in Tokoiti Forest. Confidential contract report, NZFRI.
44. Olykan, S.T.; Graham, J.D.; **Clinton, P.W.** 1998. Installation report for the Wenita Forest Products UMCY series C, FR190/9, in Berwick Forest. Confidential contract report, NZFRI.
45. Olykan, S.T.; **Clinton, P.W.** 1997. UMCY trial installation and associated work for Wenita Forest Products Limited. Work Plan, New Zealand Forest Research Institute, Rotorua.
46. Olykan, S.T.; **Clinton, P.W.**; Graham, D.; Skinner, M.F. 1996. Installation report for the Post-Establishment Decline trial, FR 258, in Paparoa Forest for Timberlands West Coast. Confidential report, New Zealand Forest Research Institute, Rotorua. Project record No. 5294.
47. Olykan, S.T.; **Clinton, P.W.**; Graham, D.; Skinner, M.F. 1996 Report on the analysis of the 1995/96 foliage nutrient and tree growth data from the Post-Establishment Decline trial, FR 258, Paparoa Forest. Confidential report, New Zealand Forest Research Institute, Rotorua.
48. Olykan, S.T.; **Clinton, P.W.**; Graham, D.; Skinner, M.F. 1996. Post-establishment decline trial (FR 258): An analysis of the 1996 foliar and tree growth Data. Confidential report, New Zealand Forest Research Institute, Rotorua.
49. Olykan, S.T.; **Clinton, P.W.**; Skinner, M.F.; Graham, D. 1997. Post-establishment Decline trial (FR 258): An analysis of the 1997 foliar and tree growth Data. Confidential report, New Zealand Forest Research Institute, Rotorua.
50. Olykan, S.T.; **Clinton, P.W.** 1996. Design of nutrition management research strategy for City Forest Ltd. Confidential report, New Zealand Forest Research Institute, Rotorua.
51. Olykan, S.T.; **Clinton, P.W.**; Skinner, M.F. 1995. Review of the Timberlands West Coast 1995 Fertiliser programme for radiata pine. Confidential contract report, New Zealand Forest Research Institute, Ilam.
52. Skinner, M.F.; Graham, J.D.; **Clinton, P.W.**; Kimberley, M.O. 2000. Comparison of nitrogen fertiliser effects on the nitrogen nutrition of radiata pine. Report 4. Foliar N

- dynamics at Woodhill and Kaingaroa Forests 28 months after N fertiliser application. New Zealand Forest Research Institute Limited Rotorua, New Zealand.
53. Skinner, M.F.; Graham, J.D.; **Clinton, P.W.** 1999. Comparison of nitrogen fertiliser effects on the growth and nutrition of radiata pine. Report No 3. Second year results at Woodhill and Kaingaroa Forests. Confidential contract report.
 54. Skinner, M.F.; Graham, J.D.; **Clinton, P.W.** 1999. Comparison of nitrogen fertiliser effects on the growth and nutrition of radiata pine on a pakihi site on the West Coast of the South Island. Report No 2. Second year results from Paparoa Forest. Confidential contract report for Timberlands West Coast.
 55. Skinner, M.F.; Graham, J.D.; **Clinton, P.W.** 1999. Comparison of nitrogen fertiliser effects on the growth and nutrition of radiata pine on pakihi site on the west site on the West Coast of the South Island. Report 1. First year results from Paparoa Forest. Confidential Report, New Zealand Forest Research Institute Limited.
 56. Skinner, M.F.; Graham, J.D.; **Clinton, P.W.** 1999. Comparison of nitrogen fertiliser effects on the growth and nutrition of radiata pine. Report 2. First year results at Woodhill and Kaingaroa Forests. Confidential Report, New Zealand Forest Research Institute Limited.
 57. Richardson, B.; Kimberley, M.O.; **Clinton, P.W.** 2002. Modelling effects of weeds on radiata pine growth on dry sites. New Zealand Site management cooperative report 116.
 58. **Clinton, P.W.**; Payn, T.W.; Sun, O.J.; Leckie, A.C.; Richardson, B. 1998. Decision making for managing the impacts of weeds on radiata pine growth on sites of different water and nutrient supply. New Zealand Forest Site Management Co-operative report.
 59. **Clinton, P.W.**; Payn, T.W.; Sun, O.J., Leckie, A.C.; Richardson, B. 1997. Decision making for managing the impacts of understorey vegetation on radiata pine growth on sites of different water and nutrient supply. Confidential report to New Zealand Forest Site Management Cooperative.
 60. **Clinton, P.W.**; Sun, O.J. Payn, T.W.; Leckie, A.C. 1996. Effects of nitrogen fixation by understorey on nitrogen availability after three years of interspecific competition Confidential report to New Zealand Forest Site Management Cooperative.
 61. **Clinton, P.W.**; Sun, O.J.; Payn, T.W.; Leckie, A.C. 1996. Impacts of understorey vegetation on growth, foliage chemistry of four-year-old radiata pine. Confidential report to New Zealand Forest Site Management Cooperative.
 62. Kimberley, M.O.; **Clinton, P.W.** 2000. Analysis of Eyrewell weed competition experiment at age seven. Confidential report to New Zealand Forest Site Management Cooperative.
 63. Sun, O.J.; **Clinton, P.W.**; Payn, T.W. 1996. Nutrient balance in young *Pinus radiata* D.Don trees as affected by different types of understorey vegetation in North Canterbury, New Zealand. Confidential report to New Zealand Forest Site Management Cooperative.

Conference presentations

Senior author on more than 30 presentations at national and international conferences, e.g.

1. Wakelin, S.A.; Smaill, S.J.; **Clinton, P.W.**; O'Callaghan, M.; Condrón, L. 2017. The phylogenetic and functional composition of forest soil ecosystems may be more susceptible to shifts in climate than land use. 125th IUFRO Conference Freiburg, 20 September 2017.
2. Smaill, S.J.; Addison, S.; Garrett, L.; **Clinton, P.W.** 2017. Bringing a microbial dimension to the management of current and future forests. 125th IUFRO Conference Freiburg, 20 September 2017.
3. **Clinton, P.W.** 2017. Future expectations of forest soils: increased productivity within environmental limits driven by new knowledge. Joint Australia and New Zealand Soil Science Society conference, 13 December 2016, Queenstown.
4. Renwick, A.; Dynes, R.; Wreford, A.; Johnstone, P.; Edwards, G.; Hedley, C.; King, W.; **Clinton, P.W.** 2017. Next Generation Solutions; a framework for prioritising innovation. Proceedings Fertiliser and Lime Research Centre Conference, 7–9, February 2017, Palmerston North.
5. **Clinton, P.W.**; Payn, T.; Edwards, P. 2016. Recent developments in plantation policy in New Zealand. Regional IUFRO Conference, 27 October 2016, Beijing.
6. **Clinton, P.W.** 2015. What does the future hold for Forest Soils and what are some of the challenges ahead? International Symposium on Forest Soils: Linking Soil Processes to Forest Productivity and Water Protection under Global Change (ISFS 2015), 24–28 October 2015, Fuzhou.
7. **Clinton, P.W.** 2014. Introduction to Cooperative research in New Zealand and where it is today. 16 October 2014, Atlanta.
8. **Clinton, P.W.** 2014. Future expectations of Forest Soils. IUFRO World Congress, 7 October 2014, Salt Lake City.
9. **Clinton, P.W.** 2014. Manipulating forest soils: are there limits? IUFRO World Congress, 7 October 2014, Salt Lake City.
10. Polglase, P.; White, D.; Clinton, P.W.; Payn, T.W. 2013. Closing the productivity yield gap. Global planted forests congress: planted forests providing ecosystem services and landscape restoration. May 2013, Dublin.
11. **Clinton, P.W.** 2013. Future expectations of forest soils: increased productivity, environmental limits, new knowledge and understanding. Proceedings of International Symposium on Forest Soils, 17–20 September 2013, Shenyang, China.
12. **Clinton, P.W.** 2012. Plantation nutrition management in New Zealand – 25 years on. 25th Annual Fertiliser and Lime Research Centre workshop, 8 February, Massey University.
13. Hock, B.; **Clinton, P.W.** 2012. Value-driven sustainable forest management in New Zealand. Presented at the 8th International Conference on Environmental, Cultural, Economic and Social Sustainability, 10–12 January 2012, Vancouver.
14. Xue, J; Dungey, H S; **Clinton, P W**; Niollet, S; Henley, D G; Leckie, A C. 2012. Genetic variation in foliar 13C in relation to radiata pine growth at a dry site – implications

- for using ^{13}C signature as a screening parameter for drought tolerant genotypes. International Conference on Sustainable Forest Management Adapting to Climate Change Conference Proceedings, 13–16 October 2012, Beijing, China.
15. **Clinton, P.W.**; Graham, D.; 2011. Tree growth response in second rotation to P fertilisers at the Riverhead Museum Plots. ANZIF conference, Auckland, 5 May 2011.
 16. **Clinton, P.W.** 2011. The Impact of Harvesting Radiata Pine on site Productivity (LTSP series 1) ANZIF conference, 5 May 2011, Auckland.
 17. **Clinton, P.W.**; Xue, J. 2010. Effect of weed control and its interaction with Boron fertiliser on radiata pine growth. 17th Australasian Weeds Conference, New Frontiers, 26–30 September 2010, Christchurch, NZ.
 18. **Clinton, P.W.** 2010. National benefits from forests and forestry. Annual conference New Zealand Association of Resource Managers, 23 September 2010.
 19. **Clinton, P.W.**; Payn, T.W.; Smaill, S.J.; Coker, G. 2009. Importance of productive capacity for the New Zealand Forest Industry. Written paper for the XIII world forestry congress in Argentina in October 2009.
 20. Hickson, A.C.; Smaill, S.J.; **Clinton, P.W.** 2008. The effect of bacterial phytohormones on *Pinus radiata* at a plantation level. New Zealand Microbiological Society Conference, 18–21 November, Christchurch, New Zealand.
 21. Razavy, E; **Clinton, P.W.**; Norton, D.; Beare, M.; Fredrich, R. 2009. Evaluation of some chemical and spectroscopic parameters during biodegradation of the soluble organic matter. International Symposium on Soil organic matter Dynamics: Land Use, Management and Global Change. 6–9 July, Colorado Springs, Colorado, USA.
 22. Wang, H.; Mark O. Kimberley, M.O.; Wilks, P.J.; **Clinton, P.W.** 2009. Using biosolids to improve pine forest production in a low fertility soil. Fertiliser and Lime research centre workshop, Palmerston North, February 2009.
 23. Khan, R.U.; Loganathan, P.; Xue, J.; **Clinton, P.W.**; Anderson, C.W.N. 2008. Effect of boron fertilizer on soil boron fractionation and availability in two soils under *Pinus radiata* plantation. In: Proceedings of Joint Soils Conference of the Australian and New Zealand Societies of Soil Science. 1–5 December 2008, Palmerston North, New Zealand.
 24. **Clinton, P.W.**; Tizzard, A.; Smaill, S. 2007. Digging deeper for better use of soil resources. Soil Plant Microbe Interactions and Plant Health Workshop, National Centre for Advanced Bio-protection Technologies, 11–12 April 2007, Lincoln University.
 25. **Clinton, P.W.**; Payn, T.W. 2006. Planted forests: a sustainable land use. Soils and Society, New Zealand Soil Society Conference, 27–30 November 2006, Rotorua.
 26. **Clinton, P.W.**; Payn, T.W.; Quinn, J.; Phillips, C.J.; Brockerhoff, E.G.; Barnard, T. 2006 Protecting and enhancing the environment through Forestry. Fertiliser and Lime Research Centre Workshop, 8 February 2006, Palmerston North.
 27. **Clinton, P.W.**; Leckie, A.C. 2006. Distribution of nutrients and impact on tree growth 4 years after application of biosolids. Proceedings of the New Zealand Land treatment Collective Conference, 14–17 March 2006, Nelson.

29. **Clinton, P.W.**; Beets, P.N.; Coker, G.; Davis, M.R.; Parfitt, R.L.; Payn, T.W.; Smaill, S.; Simcock, R.C.; Watt, M.S.; Xue, J. 2005. Long-term productivity of New Zealand's plantation forests. Brisbane, IUFRO August 2005.
30. **Clinton, P.W.**; Beets, P.N.; Coker, G.; Davis, M.R.; Garret, L.; Olykan, S.T.; Parfitt, R.L.; Payn, T.W.; Smaill, S.; Simcock, R.C.; Watt, M.S. 2004. Long-term site productivity of New Zealand's plantation forests: reliance on soil health, quality and function. Joint Australian New Zealand Soil Society Conference, 5–9 December 2004, Sydney.
31. **Clinton, P.W.**; Beets, P.N.; Coker, G.; Davis, M.R.; Garret, L.; Olykan, S.T.; Parfitt, R.L.; Payn, T.W.; Smaill, S.; Simcock, R.C.; Watt, M.S. 2004. Genotype x environment interactions and their impact on assessments of site quality – a national view for New Zealand, September 2004, Bordeaux.
32. **Clinton, P.W.**; Davis, M.R.; Hart, P.B.S.; Allen, R.B.; Nordmeyer, A.H. 2003. Gaps in our knowledge – Input output nutrient budgets: implications for sustainable management of indigenous forests. Australasian Forestry Conference, Queenstown, New Zealand. April 2003.

Presentations to industry

1. **Clinton, P.W.** 2017. Our progress towards a system approach to precision forestry. Annual GCOFF conference 29–30 March 2017, Otago Museum, Dunedin.
2. **Clinton, P.W.** 2017. What lies ahead? Planning for future research programmes. Annual GCOFF conference 29–30 March 2017, Otago Museum, Dunedin.
3. **Clinton, P.W.** 2017. A systems approach to creating more value from our radiata pine forest estate. April 2017, Whangarei
4. **Clinton, P.W.** 2017. Connections matter – balancing landscapes and water. Havelock 24 May 2017
5. **Clinton, P.W.** 2016. Plant phenomics: the study of plant growth, performance and composition. 11 October 2016, Napier.
6. **Clinton, P.W.** 2016. How long does it take, how far have we got and what's on the horizon? 12 October 2016, Napier.
7. **Clinton, P.W.** 2016. Growing and managing better and more resilient forests with confidence. Annual GCOFF conference Management of Risk in Forestry, 12–13 May 2016, Novotel Hotel, Auckland Airport.
8. **Clinton, P.W.** 2016. The National Forest Ecosystem Services Forum: 5 years on. Forest Ecosystem Services Forum. Current perspectives on FES: Issues and pathways to implementation. 24 May, Wellington.
9. **Clinton, P.W.** 2015. Progressing our knowledge and understanding of Forest Ecosystem Services. Regional forest ecosystem services workshop, 10 February 2015, Rotorua.
10. **Clinton, P.W.** 2015. The vision: partners in impact. Presentation to the annual GCOFF conference. 24 March 2015, Christchurch.

11. **Clinton, P.W.** 2015. The National Forest Ecosystem Services Forum: the story so far. Presentation to the 4th National Forest Ecosystem services forum, 19 May 2015, Te Papa, Wellington.
12. **Clinton, P.W.;** Moore, J. 2014. Growing Confidence in Forestry's Future, MPI, Wellington, 18 March 2014.
13. **Clinton, P.W.;** Moore, J. 2014. Growing Confidence in Forestry's Future. Presentation to the joint FOA/FFA technical advisory groups, 10 April, Rotorua.
14. **Clinton, P.W.** 2014. Where have we come from? A guide to previous forums on forest ecosystem service. Presentation to the 3rd Forest Ecosystems Forum, Protecting and enhancing New Zealand freshwater resources through forestry". 20 May, Wellington.
15. **Clinton, P.W.** 2014. Overview and Research Aims of GCFF. Growing Confidence in forestry's future, Rotorua, 10 June 2014.
16. **Clinton, P.W.** 2014. Research to Grow confidence in Forestry's Future. Presentation to the joint APPITA/NZIF meeting, Rotorua, 14 August 2014
17. **Clinton, P.W.** 2014. The GCFF programme and research objectives: How we are going to improve economic returns? FOA Science conference, Rotorua October 2014.
18. **Clinton, P.W.** 2013. Interactions, what can we do with them? FFR IO1 TST meeting. 18 April, PF Olsen, Rotorua.
19. **Clinton, P.W.** 2013. Something old, something new, what is it about change? FFR IO1 TST meeting. 18 April, PF Olsen, Rotorua.
20. Xue, J.; **Clinton, P.W.** 2013. Integrated management of site and genetic resources for optimising tree health, growth and wood quality. FFR IO1 TST meeting, 18 April, PF Olsen, Rotorua.
21. **Clinton, P.W.** 2013. Connecting up the dots: a way forward for GxE. Presentation to the FFR TST Meeting, 18 July, Rotorua.
22. **Clinton, P.W.** 2013. What we promised in IO1: The steps towards more value and less risk. Presentation to the FFR radiata management theme meeting. 10 September 2013, Blenheim.
23. **Clinton, P.W.** 2013. Interactions: How can we use them to manage site and genetic resources" To FFR Radiata Management Theme Members Meeting 10 September 2013, Blenheim.
24. Pawson, S.; Scott, M.; Sky, A.; Didham, R.; **Clinton, P.W.** 2013. Quantifying the influence of biodiversity on decomposition processes. To FFR Radiata Management Theme Members Meeting September 10, 2013, Blenheim.
25. Paul, T.; Smaill, S.; Garrett, L.; **Clinton, P.W.** 2013. Tree species choice and the flow of ecosystem services. To FFR Radiata Management Theme Members Meeting 10 September 2013, Blenheim.
26. **Clinton, P.W.** 2012. Review of IO 1 tasks and activities. Presentation to the radiata pine management theme quarterly review, Rotorua, 19 July 2012.

27. **Clinton, P.W.** 2012. Review of IO 1 tasks and activities. Presentation to the radiata pine management theme members meeting, Rotorua, 16 August.
28. **Clinton, P.W.;** Riordan, M. 2012. Historical perspectives and future targets. Oral presentation at FFR workshop Understanding Drivers of Forest Productivity, School of Forestry, Christchurch, 6 November 2012.
29. **Clinton, P.W.;** Riordan, M. 2012. Historical perspectives and future targets. Oral presentation at FFR workshop Understanding Drivers of Forest Productivity, Rotorua, 4 December 2012.
30. **Clinton, P.W.** Stand Nutrient Dynamics. Oral presentation at FFR workshop Understanding Drivers of Forest Productivity, School of Forestry, Christchurch, 6 November 2012.
31. **Clinton, P.W.** 2012. Stand Nutrient Dynamics. Oral presentation at FFR workshop Understanding Drivers of Forest Productivity. Rotorua, 4 December 2012.
32. Garrett, L G; Coker, 2012. G.W.R.; **Clinton, P.W.** 2012. Soil as a site resource. Presentation at workshop Understanding Drivers of Forests Productivity, School of Forestry, Christchurch, 6 November 2012. Output 50448.
33. Garrett, L G; Coker, G.W.R.; **Clinton, P.W.** 2012. Soil as a site resource. Presentation at workshop Understanding Drivers of Forests Productivity, Rotorua, 4 December 2012.
34. **Clinton, P.W.** 2011. Nutrient deficiencies of New Zealand radiata pine and potential for selecting and breeding nutrient efficient genotypes. Invited presentation to the Radiata Pine Breeding Company research review. Rotorua, 5 December 2011.
35. **Clinton, P.W.** 2011. Productivity of New Zealand's plantation Forests. Productivity workshop, Distinction Hotel, Rotorua, 8 March 2011.
36. **Clinton, P.W.;** Xue, J.; Graham, D.; Coker, G. 2011. Tree nutrition and site management impacts on plantation forest productivity. Productivity workshop, Distinction Hotel, Rotorua, 8 March 2011.
37. **Clinton, P.W.;** West, G.; Riordan, M. 2010. Strategy on Productivity Research. Presentation to Radiata Pine management Theme, FFR, Rotorua, 20 October 2010.
38. **Clinton, P.W.** 2010. Investing in natural capital to increase returns for forestry. Oral presentation to FFR Radiata Pine Management Theme, 17 July 2010.
39. **Clinton, P.W.** 2010. Examples of environmental services research. Oral Presentation to Envirolink science roadshow for Marlborough District Council, 30 July, Blenheim.
40. **Clinton, P.W.** 2010. Forest nutrition tools. Oral presentation to FFR Radiata Pine Management Theme. 3 September, Nelson.
41. **Clinton, P.W.** 2010. Impacts of nutrition management tools. Oral presentation to FFR Radiata Pine Management Theme. 3 September, Nelson.
42. Baillie, B.; **Clinton, P.W.;** Hock, B. 2010. The water story. Oral presentation to FFR Environment and Social Theme. 3 September, Nelson.

43. Palmer, D.; **Clinton, P.W.**; Payn, T. 2010. Magnitude and frequency: Modelling forest erosion. Oral presentation to FFR Environment and Social Theme. 3 September, Nelson.
44. Paul, T.H.S.; **Clinton, P.W.** 2010. The future for functional forests. Oral presentation to FFR Environment and Social Theme. 3 September, Nelson.
45. Richards, K.; **Clinton P.W.** Science progress within the Environment and Social theme. Presentation to FFR CEO's forum. 28 July, Wellington.
46. Yao, R.; **Clinton, P.W.**; Turner, J. 2010. Framework for incorporating biodiversity into a national forestry model. Oral presentation to FFR Environment and Social Theme. 3 September, Nelson.
47. Payn, T.W.; Höck, B.; Turner, J.; Yao, R.; Barnard, T.; **Clinton, P.W.** 2010. New Forest Products for Maori. Oral presentation "Whenua: Sustainable Futures with Māori Land" in Rotorua, New Zealand. 21–23 July 2010.
48. Payn, T.W. Barbara Hock, **Clinton, P.W.** and Chris Goulding 2010. Monitoring systems for forestry and some economic implications. 4th national environmental monitoring forum. 11 May 2010, Wellington.
49. **Clinton, P.W.** 2010. Overview and direction of site productivity research. Presented at the FFR Environment and Social theme Members' Meeting, CT Club, 18 March 2010, Rotorua.
50. Hock, B.; **Clinton, P.W.** 2010. Improved methods for indicators. Presented at the FFR Environment and Social Members' Meeting, CT Club, Rotorua, 18 March 2010
51. Hock, B.; **Clinton, P.W.** 2010. Determining Priorities for Sustainability Research on New Zealand Forestry. Technical Report FFR Environment and Social theme
52. Khan, R.U.; Anderson, C.W.N.; Loganathan, P.; Xue, X.; **Clinton, P.W.** 2010. Effect of slow release boron fertiliser on *Pinus radiata* growth, Boron uptake and photosynthesis. Fertiliser and Lime Research Council Annual Meeting, Palmerston North, February.
53. **Clinton, P.W.** 2009. Overview of PEEF IO1 – What has environment got to do with it? Presentation to FFR radiate pine management theme. 25 August 2009, Napier.
54. **Clinton, P.W.**; Richards, K. 2009. The steps towards more value and less risk. Presentation to FFR board, 3 September 2009, Rotorua.
55. **Clinton, P.W.**; Phillips, C.J.; Coker, R. 2009. Redwoods – what have we been waiting for? Technical Note Environment and Social theme, FFR.
56. **Clinton, P.W.**; Jones, H. 2009. Over view of soil carbon research in core Scion programmes. Invited presentation to SLURI science forum, Palmerston North 25 June 2009.
57. **Clinton, P.W.** 2009. Can we increase productivity over night? Presentation to FFR radiate pine management theme. 10 March, Christchurch.
58. **Clinton, P.W.** 2008. Protecting and enhancing the environment through forestry – an introduction to the new FRST programme. Forest Health Collaborative 13 November.

59. **Clinton, P.W.** 2008. Waste Resources, Overview, results and Outlook. Joint ESR and Scion enduser meeting. Pouria, 5 March 2008.
60. Jones, H.S.; Davis, M.R.; **Clinton, P.W.** 2009. Discussion of plans for the design and establishment of new experimental work in existing plantations. Report Environment and social theme FFR.
61. Palmer, D.J.; **Clinton, P.W.**; Payn, T.W. 2010. Modelling the magnitude and frequency of landslide erosion for marginal lands. Work plan Environment and Social theme, FFR.
62. Palmer, D. J.; Hock, B.K.; Jones, H.S.; **Clinton, P.W.**; Payn, T.W.; Paul, T.S.H. Yao, R.T.; Turner, J.A. 2009. Positioning future forests: modelling, criteria and Thresholds. Report Environment and social theme FFR.
63. Palmer, D.J.; Hock, B.K.; Jones, H.S.; **Clinton, P.W.**; Payn, T.W. 2009. Positioning future forests: Identifying areas that could benefit from the establishment of forest cover. Report Environment and social theme FFR.
64. Paul, T.S.H.; **Clinton, P.W.**; Davis, M.R. 2009. Design and establishment of new experimental trials in future forests. Report Environment and social theme FFR.
65. Paul, T.H.S.: **Clinton, P.W.** 2010. Design and establishment of new experimental trials in future forests. Technical Report FFR Environment and Social theme.
66. **Clinton, P.W.** 2009. Nutrients and the E in GxE. Invited presentation to the joint Future Forests Research Ltd and Radiata Pine Breeding Company workshop on Genotype x environment interactions. 17 June 2009, Rotorua.
67. **Clinton, P.W.** 2009. Can we increase productivity over night? Presentation to Future Forests Research Ltd radiata pine management theme, 10 March, Christchurch.
68. **Clinton, P.W.** 2008. Towards better use of soil resources and new understanding of plant microbe interactions. Presentation to Future Forests Research Ltd. 28 July 2008, Rotorua.
69. **Clinton, P.W.** 2008. Waste to resource: overview and selected highlights. Presentation to the Ministry for the Environment. Wellington, 25 July.
71. **Clinton, P.W.** and Hickson, A. 2008 What else is in the soil? New territory for plant microbe interactions. Rolleston field day Farm Forestry Association Annual Conference. 28 March 2008.
72. **Clinton, P.W.** 2008. Towards better use of soil resources and new understanding of plant microbe interactions New Zealand Forest Site Management Cooperative Meeting. 13 March 2008, Timaru.
73. Clinton, P.W. 2008. Waste resources, overview, results and outlook. Joint ESR and Scion enduser meeting. 5 March 2008, Pouria.
74. **Clinton, P.W.** 2007. Forests and Land. Presentation to New Zealand Forest Site Management Co-op. 14 May 2007., Gisborne.
75. **Clinton, P.W.** 2007. Decision making for Waste Managers, Joint Ensis- ESR Biosolids enduser meeting. 11 March 2007, Rotorua.
77. **Clinton, P.W.** 2006, Cooperative Site management Research – the first Twenty years. Presentation to the joint meeting of the New Zealand Forest Site

- Management, Stand growth and modelling and Plantation Management Cooperatives. 25 October 2006, Palmerston North.
78. **Clinton, P.W.** 2006. Seedling nutrition following small coupe harvesting. Invited presentation to MAF IFU workshop. 8 September 2006, Lincoln.
 80. **Clinton, P.W.** 2006. Cooperative Site management Research – the first Twenty years. Presentation to the joint meeting of the New Zealand Forest Site Management, Stand growth and modelling and Plantation Management Cooperatives. 25 October 2006, Palmerston North.
 81. **Clinton P.W.** 2006. Waste to resources – update on progress and direction, Joint ensis- ESR Biosolids enduser meeting. 14 March 2006, Nelson.
 83. **Clinton, P.W.** 2005. Log removal and nutrient cycling in managed native forests. Presentation to the Indigenous forestry Unit, MAF, Christchurch, 26 August 2005.
 85. **Clinton, P.W.** 2005. Soil microbe plant interactions. Invited presentation. Soil microbes and ecosystem function workshop, Landcare Research. 21–22 March, Lincoln.
 86. **Clinton, P.W.** 2004. Nutritional genetics, site and wood quality. Presentation to New Zealand Forest Site Management Co-op, Christchurch, 26 November 2004.
 87. **Clinton, P.W.** 2004. Land use change issues. Presentation to New Zealand Forest Site Management Co-op. 26 November 2004, Christchurch.
 88. **Clinton, P.W.** 2004. A review of current biosolids research undertaken by the Waste to resource Programme. Joint Australian New Zealand Biosolids research programme meeting. 8 December 2004, Sydney.
 89. **Clinton, P.W.** 2003. Linking soils to cambial processes: food for thought. Presentation to New Zealand Forest Site Management Co-op. 20 November 2003.

Tertiary education sector

Actively involved in the current supervision of the following postgraduate student at the University of Canterbury.

1. Marta Gallart Diumenge PhD on “Developmental plasticity in *Pinus radiata* (D.Don).
2. Mathias Christina, Gael Cardinal and Maud Champagne (post doc, MSc and intern) for the project management and risk analysis of an invading plant species (*Ulex europaeus* (L.)): how socio-ecological niche with population dynamics modelling under a wide range of climates can help.

Completed students projects – contributed to their career development as productive scientists

1. Marta Gallart (PhD) Genetic and environmental influences on tree nutrition in *Pinus radiata* (D.Don). Impacts of nitrogen source in tree growth and root associated communities. University of Canterbury.
2. Raza Kan (PhD) Soil and plant response to Boron fertiliser. Massey University
3. Schaap, J. 2011. Nitrogen fertilization and tree species effect on the soil microbial communities and consequences for soil carbon. MSc Thesis University of Canterbury
4. Ehsan Razavy Toosi 2010. Soluble organic matter, its biodegradation, dynamics and abiotic production. PhD University of Canterbury.
5. Alicia Buergler 2008. Soil quality indicators. PhD Department of Forest Engineering, Oregon State University
6. Horacio Bown 2007. Impact of nutrient availability on conversion efficiency of solar radiation into biomass of *Pinus radiata* plantations. PhD University of Canterbury.
7. Sarah Flynn 2009. Functional diversity in pine plantations: Role of indigenous understorey biodiversity in the nutrient cycling process. PhD University of Auckland
8. Gerty Gielen 2008. The fate and effects of pharmaceuticals in the terrestrial ecosystem. PhD University of Canterbury.
9. Simeon Smaill 2006. Molecular and chemical aspects of microbial diversity in forest soils. PhD University of Canterbury.
10. Graham Coker 2006. Modelling Leaf area development for two contrasting species. MSc University of Canterbury.
11. Gofred Sialumba 2009. Effect of intensive silviculture on growth and wood stiffness. University of Canterbury.
12. Ehsan Razavy Toosi 2009. Biodegradation of dissolved organic carbon from different landuses – significance for long term carbon storage. PhD University of Canterbury.
13. Pat Denholm 2003. Biodiversity, biosolids and bioindicators in *Pinus radiata* D.Don planted forests. PhD University of Canterbury.
14. Jianming Xue 2003. Effects of Biuret addition on soil nitrogen transformations and Douglas fir growth. PhD University of Canterbury.
15. Katharine Adam 2003 The environmental and Health implications of the decomposition of biosolids. MSc University of Canterbury.
16. Girsha Murty 2001. Effects of litter and woody debris quality on decomposition and nutrient release in exotic forests in New Zealand PhD Lincoln University.
17. Damian Byrne 2001. Internal cycling of nitrogen in second order branches of *Pinus radiata* D.Don. MSc Lincoln University.
18. Blair Miller 2000. Development of water use models for dryland *Pinus radiata* agroforestry systems. PhD Lincoln University.
19. Madan Gautum 1999. Mechanisms of competition in radiata pine agroforestry systems. PhD Lincoln University.
20. Richard Jackman 2001. Decomposition studies on a selection of native New Zealand fibrous plants. MSc University of Canterbury.

21. Simeon Smaill 2001. The decomposition of *Nothofagus fusca* floral and bark litter. MSc University of Canterbury.
22. Rosa Rivas Palma 2000 Evaluation of ammonia volatilization, carbon dioxide evolution and N balance from biosolids following application to forest soils. MSc University of Canterbury.
23. Purtrato Nugroho 1998. Soil CO₂ and O₂ concentrations under radiata pine in competition with pasture or weeds: impact on root growth and respiration. MSc University of Canterbury.
24. Jared T. Baker 1997. Fine root dynamics in radiata pine in response to irrigation and competition on the Canterbury plains. MSc, University of Canterbury.
25. Kim Weijtmans 2004. Influence of vegetation and soil quality on arbuscular and ectomycorrhizal colonisation in manuka (*Leptospermum scoparium*) University of Wageningen.
26. Marika Fritzsche 2006. The uphill struggle to control Gorse (*Ulex europaeus*) and Broom (*Cytisus scoparius*) in New Zealand. University of Applied Sciences in Eberswalde, Germany.

Research Internships from Ecole Polytechnique, Les grande Ecoles Francis

1. Marion Bardy 2003. "Assessing sustainability of forest management through the changes in microbial community structure". Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
2. Olivier Bouc 2003. "Assessing sustainability of forest management through the changes in microbial community activity". Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
3. Marion Dewagenaere 2004. "The fate of phosphorus derived from biosolids applied to plantation forests. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
4. Emmanuel Romieu 2004. "The short and long term effects of applied Boron on two forest soils. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
5. Jean-Philippe Facon 2004. "Wood quality in mini plantations: some preliminary results". Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
6. Sabine Lemoyne de Forges 2005. The environmental status of forestry in New Zealand: a semi-empirical nutrient balance model. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
7. Melanie Vergnon 2005. Screening for plant growth-promoting rhizobacteria (PGPR) in *Pinus radiata* plantations. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
8. Dominique Tafani 2006. Implications of wood decay for successful land use change strategies involving previously forested land. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.

9. Marika Fritzsche 2006. The uphill struggle to control Gorse (*Ulex europaeus*) and Broom (*Cytisus scoparius*) in New Zealand. BSc thesis, University of Applied Sciences in Eberswalde, Germany.
10. Olivier Grandvoient 2006. Determination of critical Buckling height in *Pinus radiata*. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
11. Caroline Mahe 2006. Study of the influence on rhizosphere communities of species and subspecies, in the case of *Pinus radiata* and Leyland Cypress. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.
12. Julia Bertret 2009. Sustainable decision making in biosolids management: The Christchurch experience. Insa lyon, Département de bio informatique.
13. Tristan Martin 2014. Metabolic profile of a Douglas-fir forest soil. Rapport de stage d'option scientifique, Ecole Polytechnique, Paris.

BForSci dissertations

1. John Soutar Bfor Sci (Hons) 2006. The effects of biosolids application on properties of wood grown under dryland conditions University of Canterbury.
2. Damion Harris 1995. The effect of specific weeds on soil Mg and soil chemical properties under radiata pine in Eyrewell Forest, Canterbury, New Zealand.
3. Dean Sheppard 1995. The effects of fertiliser, irrigation and oversowing upon *Pinus radiata* seedlings at the Eyrewell forest Coop trials. Vegetation assessment after oversowing with grass and legume species.
4. John Faherty 1995. The effects of common forest weeds on light availability and growth of pinus radiata in Eyrewell Forest, Canterbury.
5. Vanessa Kingsbury 1993. Effect of vegetation, competition and fertiliser on plant and soil water availability in Eyrewell forest, Canterbury, New Zealand.

Thesis examined

1. Stanley J. Sochacki. 2016. Carbon mitigation from agroforestry in salinized low rainfall farmland landscapes. Murdoch University.
2. John T. Scott 2002. Soil Phosphorus dynamics in a temperate silvopastoral system. PhD, Lincoln University.
3. Nicole J. Matters 2002. Effective use of solid-state ¹³C nuclear magnetic resonance spectroscopy for studying forest soil organic matter composition and quality. PhD Griffith University.
4. Anil Kumar Hooda 2000. Nitrogen transformations and cycling in soils of effluent irrigated *Eucalyptus globulus* (Labill.) plantations. PhD, University of Melbourne
5. Hongyuan Xu 2000. Modelling photosynthetic CO₂ fixation in radiata pine clones with contrasting crown characteristics at age five at Dalethorpe, Canterbury, New Zealand. PhD, University of Canterbury.
6. Glenn Rutter 2004. Decomposition of pharmaceuticals in soil. MSc, University of Canterbury.

7. G.D. Bandara 1997. Ecophysiology of clonal and seedling trees of *Pinus radiata* in an agroforestry system. PhD, Lincoln University.
8. Stephanie Walters 2001. The microbial decomposition of six species of New Zealand Bryophytes. MSc, University of Canterbury.
9. Irdika Mansur 1994. Nitrogen uptake dynamics and biological nitrogen fixation in a silvopastoral system. MforSc, University of Canterbury.
10. J. Wanjiku 1996. Biological nitrogen fixation of some legumes at a coastal sand dune in New Zealand. MSc Lincoln University.