

Robin Walker  
Agriculture & Business Management - Aberdeen  
Safe & Improved Food Challenge Centre  
Scotland's Rural College  
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United Kingdom  
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## Research interests

I am a researcher and lecturer with over 25 years experience in crop and soil systems research, teaching and KE delivery. I am programme lead for the distance learning MSc in Agricultural Professional Practice and have been teaching into the Organic Farming distance learning MSc for over 15 years. My research focuses on low input cropping systems and how these can be managed more efficiently in terms of the balance between production, economics and environmental factors. I am also interested in how to optimise the integration of crops, grassland and livestock. Areas of interest include:

Diversity in cropping systems

Rotational effects on cropping systems, both organic and non-organic.

Environmental impacts of crops, their varieties and their role in rotations within agricultural ecosystems.

Crop / soil nutrient dynamics within cropping / farming systems (particularly N, P, trace elements and organic matter).

Improving the optimization / integration of leguminous species / varieties into cropping systems with an emphasis on intercropping.

Home grown protein cropping options

Cover crops & green manures

## Qualifications

PhD, Department of Agriculture, Wye College, University of London  
Award Date: 30 Apr 1999

Bachelor, University of Liverpool  
Award Date: 14 Jul 1992

## Employment

### Programme Team Leader

Agriculture & Business Management - Aberdeen  
Scotland's Rural College  
1 Apr 2021 → present

### Safe & Improved Food Challenge Centre

Scotland's Rural College  
21 Oct 2020 → present

### Programme Team Leader

Scotland's Rural College  
Edinburgh, United Kingdom  
15 Sep 2005 → present

HRI Wellesbourne

United Kingdom  
1 Oct 1995 → 1 Jan 1999

### **Capespan UK**

United Kingdom  
15 Jan 1993 → 15 Jul 1995

## **Supervision**

PhD student - Verena Schmidt - Pasture-associated laminitis in ponies: The grassroots! (2020-2024)

PhD student - Catriona Willoughby - Designing Crop Rotations that are fit for the Future. (2019-2023)

PhD student - Rose Boyko - Investigation of the impact soil pH management has on Scotland's grassland productivity (2018-2022)

PhD student - Samantha Dolan - Topsoil and Subsoil Phosphorus Dynamics: Evidence from long-term experiments (2015-2019)

PhD student - Anastasia Fountouli - Are pH driven shifts to soil physical structure caused by chemical or biological process? (2013-2017)

Also supervisor for numerous MSc and Honours year student presentations

## **Teaching**

MSc Agricultural Professional Practice - distance learning: Programme leader and Core Team member

Topical Issues in Modern Agriculture - module lead

MSc Organic Farming - distance learning: Core Team member

Organic Crop and Grassland Production - module lead

Soils and Nutrient Cycling - module lead

## **Research outputs**

### **Soil pH influences the structure of virus communities at local and global scales**

Lee, S., Sorensen, J. W., Walker, R. L., Emerson, J. B., Nicol, G. W. & Hazard, C., Mar 2022, In: Soil Biology and Biochemistry. 166, 108569.

### **Supporting wild pollinators in agricultural landscapes through targeted legume mixtures**

Cole, L. J., Baddeley, J. A., Robertson, D., Topp, C. F. E., Walker, R. L. & Watson, C. A., 1 Jan 2022, In: Agriculture, Ecosystems and Environment. 323, 107648.

### **Assessing the contribution of legume inclusion in crop rotations to soil health and ecosystem services: A case study from UK field trials**

Willoughby, C., Watson, CA., Topp, CFE., Walker, RL., Hilton, AJ., Hallett, P. D., Paton, G. I. & Stockdale, E., 3 Sep 2021.

### **Rye-vetch mixtures – their potential as multifunctional crops**

Watson, CA., Baddeley, JA., Topp, CFE. & Walker, RL., 3 Sep 2021.

### **Methane-derived carbon flows into host-virus networks at different trophic levels in soil**

Lee, S., Sieradzki, E. T., Nicolas, A. M., Walker, R. L., Firestone, M. K., Hazard, C. & Nicol, G. W., 10 Aug 2021, (First published) In: Proceedings of the National Academy of Sciences of the United States of America. 118, 32, e2105124118.

### **Nutritional and chemical profiling of UK-grown potato bean (*Apios americana* Medik) reveal its potential for diet diversification and revalorisation**

Neacsu, M., Vaughan, N., Perri, V., Duncan, G., Walker, RL., Coleman, M. & Russell, W., May 2021, In: Journal of Food Composition and Analysis. 98, 103821.

#### **Evaluation of the nutritive value of legume alternatives to soybean meal for broiler chickens**

Olukosi, OA., Walker, RL. & Houdijk, JGM., 1 Nov 2019, In: Poultry Science. 98, 11, p. 5778-5788 11 p.

#### **Cropping Systems and Crop Choice**

Walker, RL., Apr 2019, *The Science Beneath Organic Production*. Atkinson, D. & Watson, C. (eds.). Croydon: John Wiley & Sons Ltd., p. 79-85

#### **Crop Protection and Food Quality: Challenges and Answers**

Walker, RL. & Atkinson, D., Apr 2019, *The Science Beneath Organic Production*. Atkinson, D. & Watson, C. (eds.). Croydon: Wiley-Blackwell Publishing Ltd, p. 213-235

#### **Crop Protection: Meeting the Nutrient Needs**

Atkinson, D. & Walker, RL., Apr 2019, *The Science Beneath Organic Production*. Atkinson, D. & Watson, C. (eds.). Croydon: Wiley-Blackwell Publishing Ltd, p. 151-167

#### **Crop Rotations: The Core of Organic Production**

Atkinson, D. & Walker, RL., Apr 2019, *The Science Beneath Organic Production*. Atkinson, D. & Watson, C. (eds.). Croydon: Wiley-Blackwell Publishing Ltd, p. 87-109

#### **Optimising Crop Production in Organic Systems**

Atkinson, D. & Walker, RL., Apr 2019, *The Science Beneath Organic Production*. Atkinson, D. & Watson, C. (eds.). Croydon: Wiley-Blackwell Publishing Ltd, p. 133-150

#### **The potential for Nitrogen-fixing crops to deliver foraging resources for insect pollinators**

Cole, LJ., Robertson, DA., Harrison, W., Baddeley, JA., Walker, RL. & Watson, CA., 2018, In: Aspects of Applied Biology. 138, p. 107-112

#### **A comparative nitrogen balance and productivity analysis of legume and non-legume supported cropping systems: the potential role of biological nitrogen fixation**

Iannetta, PPM., Young, M., Bachinger, J., Bergkvist, G., Doltra, J., Lopez-Bellido, RJ., Monti, M., Pappa, VA., Reckling, M., Topp, CFE., Walker, RL., Rees, RM., Watson, CA., James, EK., Squire, GR. & Begg, GS., Nov 2016, In: Frontiers in Plant Science. 7, 1700.

#### **Trade-offs between economic and environmental impacts of introducing legumes into cropping systems**

Reckling, M., Bergkvist, G., Watson, CA., Stoddard, FL., Zander, PM., Walker, RL., Pristeri, A., Toncea, I. & Bachinger, J., 23 May 2016, (First published) In: Frontiers in Plant Science. 7, 669, p. 1 - 15 15 p.

#### **Use of a coupled soil-root-leaf model to optimise phosphate fertiliser use efficiency in barley**

Heppell, J., Payvandi, S., Talboys, P., Zygalkis, KC., Langton, D., Sylvester-Bradley, R., Edwards, AC., Walker, RL., Withers, P., Jones, DL. & Roose, T., 14 Apr 2016, (First published) In: Plant and Soil. 406, 1, p. 341 - 357 17 p.

#### **Long-term productivity of legume based crop rotations**

Watson, CA., Topp, CFE. & Walker, RL., May 2015, (First published) *Aspects of Applied Biology*. Association of Applied Biologists, Vol. 128. p. 189 - 194 6 p.

#### **Assessing soil organic matter changes in an organically managed long-term crop rotation experiment**

Cloy, JM., Rees, RM., Drewer, J., Helfrich, M., Ball, BC., Buckingham, S., Topp, CFE., Walker, RL., Watson, CA. & Mayer, C., 2015, (First published) *Aspects of Applied Biology*. Association of Applied Biologists, Vol. 128. p. 111 - 118 8 p.

#### **Modelling the optimal phosphate fertiliser and soil management strategy for crops**

Heppell, J., Payvandi, S., Talboys, P., Zygalkis, KC., Fliege, J., Langton, D., Sylvester-Bradley, R., Walker, RL., Jones, DL. & Roose, T., 2015, In: Plant and Soil. 401, 1, p. 135 - 149 15 p.

**Investigating the use of silage effluent to improve available phosphorus from Gafsa phosphate rock**

Knox, OGG., Achara, ON., Parker, J., Alegria, R., Walker, RL., Edwards, AC. & Watson, CA., 2014, (First published) In: *Communications in Soil Science and Plant Analysis*. 45, 3, p. 332 - 346 15 p.

**Seasonal nitrous oxide emissions from field soils under reduced tillage, compost application or organic farming**

Ball, BC., Griffiths, BS., Topp, CFE., Wheatley, R., Walker, RL., Rees, RM., Watson, CA., Gordon, H., Hallett, PD., McKenzie, BM. & Nevison, IM., 2014, In: *Agriculture, Ecosystems and Environment*. 189, p. 171 - 180 10 p.

**A systematic review of the environmental impacts of GM crop cultivation as reported from 2006 to 2011**

Knox, OGG., Hall, C., McVittie, A., Walker, RL. & Knight, B., Jun 2013, In: *Food and Nutrition Sciences*. 4, p. 28 - 44 17 p.

**Elemental status (Cu, Mo, Co, B, S and Zn) of Scottish agricultural soils compared with a soil-based risk assessment**

Edwards, AC., Coull, M., Sinclair, AH., Walker, RL. & Watson, CA., 23 Apr 2012, (First published) In: *Soil Use and Management*. 28, p. 167 - 176 10 p.

**Capitalizing on deliberate, accidental, and GM-driven environmental change caused by crop modification**

Knox, OGG., Walker, RL., Booth, EJ., Hall, C., Crossan, AN. & Gupta, VVSR., Jan 2012, In: *Journal of Experimental Botany*. 63, 2, p. 543 - 549 7 p.

**Legumes intercropped with spring barley contribute to increased biomass production and carry-over effects**

Pappa, VA., Rees, RM., Walker, RL., Baddeley, JA. & Watson, CA., 2012, (First published) In: *Journal of Agricultural Science*. 150, 5, p. 584 - 594 11 p.

**Revisiting herbage sample collection and preparation procedures to minimise risks of trace element contamination**

Sigrun Dahlin, A., Edwards, AC., Lindstrom, BEM., Ramezani, A., Shand, CA., Walker, RL., Watson, CA. & Oborn, I., 2012, (First published) In: *European Journal of Agronomy*. 43, p. 33 - 39 7 p.

**The effect of co-composted cabbage and ground phosphate rock on the early growth and P uptake of oilseed rape and perennial ryegrass**

Walker, RL., Edwards, AC., Maskell, P., Watson, CA., Rees, RM., Knox, OGG. & Stockdale, EA., 2012, (First published) In: *Journal of Plant Nutrition and Soil Science*. 175, p. 595 - 603 9 p.

**Using soil and plant properties and farm management practices to improve the micronutrient composition of food and feed**

Watson, CA., Oborn, I., Edwards, AC., Dahlin, AS., Eriksson, J., Lindstrom, BEM., Linse, L., Owens, K., Topp, CFE. & Walker, RL., 2012, (First published) In: *Journal of Geochemical Exploration*. 121, p. 15 - 24 10 p.

**Influence of ley duration on the yield and quality of the subsequent cereal crop (spring oats) in an organically managed long-term crop rotation experiment**

Watson, CA., Baddeley, JA., Edwards, AC., Rees, RM., Walker, RL. & Topp, CFE., 2011, (First published) In: *Organic Agriculture*. 1, p. 147 - 159 13 p.

**Nitrous oxide emissions and nitrate leaching in an arable rotation resulting from the presence of an intercrop**

Pappa, V., Rees, RM., Walker, RL., Baddeley, JA. & Watson, CA., 2011, (First published) In: *Agriculture, Ecosystems and Environment*. 141, 1-2, p. 153 - 161 9 p.

**Revisiting the multiple benefits of historical crop rotations within contemporary UK agricultural systems**

Knox, OGG., Leake, AR., Walker, RL., Edwards, AC. & Watson, CA., 2011, (First published) In: *Journal of Sustainable Agriculture*. 35, p. 163 - 179 17 p.

**Improving bioavailability of phosphate rock for organic farming**

Edwards, AC., Walker, RL., Maskell, P., Watson, CA., Rees, RM., Stockdale, EA., Knox, OGG. & Lichtfouse, E. (ed.), 2010, (First published) *Genetic engineering, biofertilisation, soil quality and organic farming*. Lichtfouse, E. (ed.). Springer, p. 99 - 117 19 p.

**Organic farming in Europe: a potential major contribution to food security in a scenario of climate change and fossil fuel depletion**

Lee, HC., Walker, RL., Haneklaus, S., Philips, L., Rahmann, G. & Schnug, E., 2008, (First published) In: Agriculture and Forestry Research. 58, p. 145 - 152 8 p.

**Potential synergistic effects between agriculture and nature conservation under the constraints of climate change**

Schnug, E., Haneklaus, S., Walker, KC., Walker, RL. & Rahmann, G., 2008, (First published) In: Agriculture and Forestry Research. 58, p. 267 - 270 4 p.

**Research in organic production systems - past, present and future**

Watson, CA., Walker, RL. & Stockdale, EA., 2008, (First published) In: Journal of Agricultural Science. 146, p. 1 - 19 19 p.

**Output and sustainability of organic ley/arable crop rotations at two sites in northern Scotland**

Taylor, BR., Younie, D., Matheson, S., Coutts, M., Mayer, C., Watson, CA. & Walker, RL., 2006, (First published) In: Journal of Agricultural Science. 144, p. 435 - 447 13 p.

**Antifungal activities of four fatty acids against plant pathogenic fungi**

Walters, DR., Raynor, L., Mitchell, A., Walker, RL. & Walker, KC., 2004, (First published) In: Mycopathologia. 157, p. 87 - 90 4 p.

**Crop protection - what will shape the future picture?**

Atkinson, D., Litterick, AM., Walker, KC., Walker, RL. & Watson, CA., 2004, (First published) In: Pest Management Science. 60, p. 105 - 112 8 p.

**The efficacy of novel physical barriers for the management of pests of field vegetable crops**

Fulton, A., Evans, KA., Walker, RL. & Powell, G., 2004, *Proceedings Crop Protection in Northern Britain 2004*. The Association for Crop Protection in Northern Britain, p. 177-182

**Volunteer potential of genetically modified oilseed rape with altered fatty acid content**

Walker, RL., Booth, EJ., Whytock, GP. & Walker, KC., 2004, (First published) In: Agriculture, Ecosystems and Environment. 104, p. 653 - 661 9 p.

**Adaptation potential of the novel oilseed crop, Honesty (*Lunaria annua* L.), to the Scottish climate**

Walker, RL., Walker, KC. & Booth, EJ., 2003, (First published) In: Industrial Crops and Products. 18, p. 7 - 15 9 p.

**Lauric acid exhibits antifungal activity against plant pathogenic fungi**

Walters, DR., Walker, RL. & Walker, KC., 2003, (First published) In: Journal of Phytopathology. 151, p. 228 - 230 3 p.

**Responses of plant growth rate to nitrogen supply: a comparison of relative addition and N interruption treatments**

Walker, RL., Burns, IG. & Moorby, J., 2001, (First published) In: Journal of Experimental Botany. 52, p. 309 - 317 9 p.

**Oilseed rape with modified fatty acid profiles: Are GM volunteers likely to be a problem?**

Walker, RL., Booth, EJ. & Walker, KC., 2000, (First published) *Aspects of Applied Biology*. Vol. 62. p. 85 - 88 4 p.

**What does the future hold for GM crops?**

Walker, RL., Walker, KC. & Booth, EJ., 2000, (First published) *Aspects of Applied Biology*. Vol. 62. p. 173 - 180 8 p.

**Effect of external N supply on the recycling of N within plants**

Walker, RL., Burns, IG. & Moorby, J., 1999, (First published) In: Acta Horticulturae. 506, p. 129 - 134 6 p.

**How do nutrients drive growth?**

Burns, IG., Walker, RL. & Moorby, J., 1997, (First published) In: Plant and Soil. 196, p. 321 - 325 5 p.

## **Awards**

### **Novel Tuber Crops Demonstration**

Walker, R.

MAINS OF LOIRSTON TRUST: £9,325.00

1/04/22 → 31/03/23

## **Projects**

### **Activity of fungicides against Ramularia leaf spot**

Havis, N., Gorniak, K., Yoxall, T. & Walker, R.

MAINS OF LOIRSTON TRUST

1/09/18 → 31/03/20

### **Benefits of diverse herbal-rich leys Project 17**

Walker, R. & Watson, C.

1/04/19 → 31/03/23

### **Historical varieties of winter wheat, spring barley and spring oats at Woodlands field, Craibstone**

Walker, R.

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2/03/20 → 1/04/21

### **Intercropping in practice: from research to on-farm trials**

Walker, R. & Watson, C.

1/05/19 → 31/08/19

### **Investigation of the impact soil pH management has on Scotland's grassland productivity**

Walker, R.

SRUC internal funding

1/10/18 → 30/09/22

### **Legumes Translated**

Revoredo Giha, C., Topp, K., Dewhurst, R., Costa Font, M., MacPherson, L., Houdijk, J., Flockhart, J., Walker, R., Hargreaves, P., Lawson, D., Newbold, J., Fischer-Moller, M. & Watson, C.

European Commission

1/11/18 → 30/04/22

### **Provision of agronomic trials for cultivation and use 2018-2023 Lot 2**

Hoad, S. & Walker, R.

Scottish Government

30/06/18 → 31/12/23

### **Redesigning european cropping systems based on species MIXtures (ReMix)**

Rees, B., Ross, D., Topp, K., Walker, R., Barnes, A. & Watson, C.

European Commission

1/04/17 → 30/04/21

### **RESAS Strategic Research Programme 2016-21 WP2.1 Crop and grassland production and disease control**

Hoad, S., Crawford, C., Bingham, I., Hoebe, P., Brennan, M., Paterson, L., Topp, K., Baddeley, J., Miller, S., Stanisz-Migal, M., Taylor, J., Harrison, B., Baker, L., Gorniak, K., Whyte, F., Bain, R., Yoxall, T., Laing, A., Griffiths, B., Watson, C., Evans, A., Burnett, F., Irvine, S., Lawson, D., Havis, N., Creissen, H., Dussart, F., Houdijk, J., Walker, R. & Swaney, J.

1/04/18 → 31/03/19

### **RESAS Strategic Research Programme 2016-21 WP2.3 Productive and sustainable land management**

Wall, E., Smith, S., Nicoll, L., Parker, J., Robertson, D., Davidson, R., Donbavand, J., Anderson, C., Roehe, R., Harrison, B., Purcell, L., Duthie, C., Gunn, G., Pritchard, T., Jones, S., Bagnall, A., Vosough Ahmadi, B., Archibald, I., Rees, B.,

Eory, V., Glenk, K., Edwards, T., Buckingham, S., March, M., Broadbent, C., Cloy, J., Hargreaves, P., Wishart, H., Griffiths, B., Fox, N., Sparks, N., Shrestha, S., Banos, G., Henry, M., Watson, C., Dickinson, J., Topp, K., Burnett, F., Kyle, J., Denholm, S., Dewhurst, R., Lawson, D., McCubbin, I., Dwyer, C., Holland, J., McCracken, D., Barratt, A., Havis, N., Stanisz-Migal, M., Miller, G., Bowen, J., Hutchings, M., Creissen, H., D'Eath, R., Baddeley, J., Houdijk, J., Coffey, M., Morgan-Davies, C., Walker, R., Turner, S., Haskell, M., Barnes, A., Athanasiadou, S., Cole, L., Sandilands, V., McLaren, A., MacLeod, M. & Smith, L.

1/04/19 → 31/03/20

#### **Underutilised Protein-Rich Resources**

Watson, C. & Walker, R.

22/06/17 → 22/01/18