

MX 0146 Sustainable food production - challenges and cropping system solutions 2021

Required reading

Introduction to sustainable cropping systems: why are they important?

Foley, J., Ramankutty, N., Brauman, K. et al. Solutions for a cultivated planet. Nature 478, 337–342 (2011). <https://doi.org/10.1038/nature10452>

Naylor R et al (2005) Losing the Links Between Livestock and Land: 310, Issue 5754, pp. 1621-1622 [DOI: 10.1126/science.1117856](https://doi.org/10.1126/science.1117856)

Major food crops and their sustainability challenges

Francis, C.A. (2005) Crop rotations. Encyclopedia of Soils in the Environment, 318-322.

Malézieux, E. et al. (2009) 'Mixing plant species in cropping systems: Concepts, tools and models: A review', in Sustainable Agriculture. [doi: 10.1007/978-90-481-2666-8_22](https://doi.org/10.1007/978-90-481-2666-8_22)

Giller, K. E. et al. (2015) 'Beyond conservation agriculture', Frontiers in Plant Science. [doi: 10.3389/fpls.2015.00870](https://doi.org/10.3389/fpls.2015.00870)

Introduction to Life cycle assessment

Garnett, T., Röös, E., Nicholson, W., & Finch, J. 2016. Environmental impacts of food: an introduction to LCA (Foodsource: chapters). Food Climate Research. Network, University of Oxford.

Tidåker P et al 2021. Towards sustainable consumption of legumes: How origin, processing and transport affect the environmental impact of pulses. Sustainable Production and Consumption <https://doi.org/10.1016/j.spc.2021.01.017>

Plant-based protein production systems

Graham PH, Vance CP 2003. Legumes: Importance and Constraints to Greater Use. Plant Physiology 131: 872-877. www.plantphysiol.org/cgi/doi/10.1104/pp.017004.

Foyer CH et al. 2016 Neglecting legumes has compromised human health and sustainable food production Nature Plants 16112 | [DOI:10.1038/NPLANTS.2016.112](https://doi.org/10.1038/NPLANTS.2016.112)

Plant nutrient management for efficient crop production and reduced environmental impact

Goulding, K., Jarvis, S. and Whitmore, A. 2008. Optimizing nutrient management for farm systems. *Philosophical Transactions of the Royal society B*, 363:667-680.

Integrated pest management - insects, diseases and weeds

Barzman M et al 2015. Eight principles of integrated pest management. *Agron. Sustain. Dev.* 35:1199–1215 [DOI 10.1007/s13593-015-0327-9](https://doi.org/10.1007/s13593-015-0327-9)

Guest DI 2003. *Plant Pathology, Principles*. Encyclopedia of Applied Plant Sciences, 2nd edition, Volume 3 <http://dx.doi.org/10.1016/B978-0-12-394807-6.00056-3>

Organic production

<https://www.ifoam.bio/en/organic-landmarks/principles-organic-agriculture> (Links to an external site.)

<https://rodaleinstitute.org/why-organic/organic-farming-practices/> (Links to an external site.)

<http://www.jordbruksverket.se/amnesomraden/odling/ekologiskodling.4.373db8e013d4008b3a18000179.html> (Links to an external site.)

Reganold JP and Wachter JM (2016) Organic agriculture in the twenty-first century. *Nature Plants* 15221. DOI: 10.1038/NPLANTS.2015.22 [Reganold and Wachter 2016.pdf](#)

Garnett T et al. (2013) Sustainable Intensification in Agriculture: Premises and Policies. *Science* 341 (6141), 33-34. DOI: 10.1126/science.1234485 [Garnett-2013-Sustainable-intensification-in-agri.pdf](#)

Darnhofer et al. (2010). Conventionalisation of organic farming practices: from structural criteria towards an assessment based on organic principles. A review. *Agron. Sustain. Dev.* 30 67–81. DOI: 10.1051/agro/2009011 [Darnhofer et al 2009.pdf](#)

Climate change and cropping systems: the two way interactions

Zhao, C., Liu, B., Piao, S., Wang, X., Lobell, D. B., Huang, Y., . . . Asseng, S. (2017). Temperature increase reduces global yields of major crops in four independent estimates. *Proceedings of the National Academy of Sciences*, 114(35), 9326-9331.

[doi:10.1073/pnas.1701762114](https://doi.org/10.1073/pnas.1701762114)

Vermeulen, S.J., Campbell, B., Ingram, J.S., 2012. *Climate Change and Food Systems*, SSRN. <https://doi.org/10.1146/annurev-environ-020411-130608>

Global perspectives on challenges to agricultural sustainability

Altieri MA, Nicholls CI, Henao A, Lana MA 2015. Agroecology and the design of climate change-resilient farming systems. Agron. Sustain. Dev. [DOI 10.1007/s13593-015-0285-2](https://doi.org/10.1007/s13593-015-0285-2)

Miguel A. Altieri & Clara I. Nicholls (2020) Agroecology and the reconstruction of a post-COVID-19 agriculture, The Journal of Peasant Studies, 47:5, 881-898, DOI: 10.1080/03066150.2020.1782891

Further reading (optional)

General

Pollan, Michael. The omnivore's dilemma: the search for a perfect meal in a fast-food world. Bloomsbury Publishing, 2009.

FAO 2018 The future of food and agriculture <http://www.fao.org/publications/fofa/en/>

WRI 2019 Creating sustainable Food Future <https://wrr-food.wri.org/>

UNEP (2016) Food Systems and Natural Resources Summary report. <http://www.resourcepanel.org/file/395/download?token=JqcqyisH>

Major food crops and their sustainability challenges

Bowden et al. (2008) Wheat growth & development. NSW Department of Primary Industries

IPM

Dara SK 2019. The New Integrated Pest Management Paradigm for the Modern Age. Journal of Integrated Pest Management. : 12 1–9 [doi: 10.1093/jipm/pmz010](https://doi.org/10.1093/jipm/pmz010)