

Unit 22: Organic Agricultural Production

Delivery guidance

Approaching the unit

Unit 22: Organic Agricultural Production covers the production of organic produce within an agricultural environment. It is a broad-based unit looking at organic systems for livestock and crops, as well as the influence that organic production systems can have on the environment. It may not be possible for all centres to have access to their own organic production systems, so it is important to plan carefully and ensure that learners have access to a good range of resources.

The promotion of skills development in an organic setting may be somewhat limited; however, centres should allow access to real-life work experience to enhance and support delivery of this unit. The inclusion of input from local employers will also boost learners' understanding of organic production.

Learners would also benefit from having access to a virtual learning environment (VLE) for sharing and storing information. This could allow learners to access worksheets, relevant web links and appropriate videos, which they can then use in order to develop and promote their understanding outside of the classroom environment.

The inclusion of relevant visits and guest speakers will give learners the opportunity to relate the theoretical aspect of the unit to the practical. Suggested visits would include an organic vegetable grower or farmer, an organic livestock farm or a visit to a feed mill where organic feed is produced. Relevant guest speakers may include organic producers themselves or sales representatives working in the organic sector.

Delivering the learning aims

Learning aim A

Learning aim A focuses on the core principles of organic agricultural production, the ecological impact that organic systems can have on the industry and how an increase in popularity has led to an increase in organic production. It would be good to begin the delivery of this learning aim by giving learners an explanation regarding the background of the organic industry. This can focus on the key industry figures that have been influential in developing organic systems, as well as the relevant regulations associated with key organic organisations. Tutors can then explore the link between soil processes, structures and fertility, which has been developed to be sustainable for both the condition of the soil health and fertility. This includes the organic agro-ecosystems that develop when practising organic production. Learners will also explore the legislative and regulatory aspects of organic production and have an awareness of current industry schemes, which can support the organic production system.

Learning aim B

Learning aim B concentrates on the production methods used in organic crop production in a country in order to help plan crop rotations. This covers soil management in more detail through the conversion process, as well as the cultivation systems that can be used to produce these. This also includes dealing with the problems within a crop production



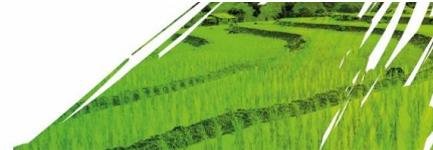
system, such as weeds, pests and the disease burden, as well as natural methods of control that can be used within the constraints of the organic production system.

Crop rotations are also discussed, and this focuses on the importance of crop choice and the potential diversity of crops within that rotation, taking into consideration the potential problems that can be caused with these cropping systems.

Tutors must ensure that they cover the environmental impacts within this learning aim, where the cultivars within a crop rotation look at the impact that they can have on the flora and fauna of the surroundings, and how these can be used positively to encourage wildlife to thrive.

Learning aim C

Learning aim C explores the production methods used in organic livestock systems in a country. This learning aim covers the choice of stock and looks at how different breeds can have an impact on the environment, as well as current legislation and codes of practice. It also concentrates on the different grazing systems, the influence of stocking rates and the use of legumes. It is important to cover the potential challenges faced in livestock management and when working in an organic system (such as the demands of markets and outlets, breeding issues, zoonoses, biosecurity), and tutors should emphasise the importance of welfare of the animals while ensuring that relevant industry standards and quality assurance criteria are met. Organic feeding regulations and practices used for feeding livestock should include nutrition and feeds, permitted crops, by-products, use of home-grown feeds and current permitted inclusion rates for non-organic foodstuffs.



Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Investigate the core principles of organic agricultural production and its ecological impact	A1 Organic principles A2 Soil processes A3 Soil fertility A4 Sustainable agro-ecosystems in an organic environment	A report or presentation evaluating the principles of organic production and the impact that soil processes and fertility can have on agro-ecosystems.
B Explore organic crop production methods in order to plan crop rotation	B1 Soil management B2 Crop rotation B3 Potential problems with crop systems	A three-year crop rotational plan for two crop species and an animal management plan for one species of livestock.
C Explore organic livestock production methods in order to plan livestock management	C1 Key principles of livestock management C2 Potential challenges in livestock management C3 Organic feeding	

Assessment guidance

For learning aim A, the assessment evidence is to be presented through a report or presentation that evaluates the principles of organic production and includes detail on the background to organic production and the regulations associated with organic production. There is also a section in this learning aim on soil processes and fertility, and so tutors may wish to include laboratory work and scientific experiments here to assess learner knowledge on soil type, pH and structure and the link this can have on agro-ecosystems. Tutors should give a detailed explanation regarding the theoretical aspects of organic production and use practical fieldwork to enhance learner understanding and support assessments.

Tutors should also demonstrate to learners how to conduct independent research and support notes taken during sessions and fieldwork. The report should be structured so that it can assess the underpinning principles of organic production.

For learning aims B and C, the assessment evidence can be separated into two parts: firstly, a crop rotation plan over a three-year period and secondly, a livestock management plan for one species of animal.

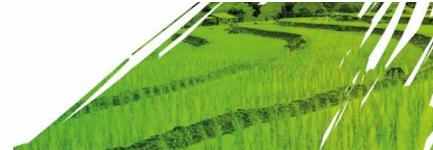
As these are two distinctly different aims, tutors may wish to deliver and assess learning aim B before starting learning aim C (or vice versa depending on the availability of resources). The use of a suitable IT applications, such as word processors, will be helpful in producing the assessment material for these learning aims.

For the first part of the assessment, a comprehensive crop rotation plan for an organic system that evaluates the impact of soil management is required. The use of a guest speaker here will ensure that learners are getting up-to-date industry knowledge to include in their work. The report requires a holistic approach to crop planning along with detailed justification for all crop choices made.



Tutors should give learners a detailed explanation into the options available to organic producers and arrange for learners to have access to an organic farm, which will complement the theory-based sessions. Learners may also collate pictorial evidence for the assessment of this unit, particularly taking evidence from their fieldwork. This evidence will be collated over a period of time and tutors need to ensure that learners have enough time for this evidence to be gathered.

For the animal management plan, learners are required to produce a plan that shows an integral approach to managing livestock, including breeding and feeding. The report needs to offer well-reasoned judgements and be accurate in its approach to integrating agro-systems. Access to an organic flock or herd is essential for the delivery and assessment of this unit. This is a good opportunity to involve employer engagement, such as a visit to a feed mill in order for learners to observe how organic feed is produced, or a guest speaker such as local organic producer who can outline the regulations for feeding organic livestock. The plan will be built up over a period of time and tutors may need to ensure sufficient time is allocated for this to take place.



Getting started

This provides you with a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Unit 22: Organic Agricultural Production

Introduction

This unit will help to develop learners' awareness of the organic production systems in both crop and livestock management in a country. It will give learners a deeper understanding of how organic systems can be set up, managed and maintained. There will be much benefit in employer engagement in the form of:

- guest speakers
- visit to local organic producer (either crops or livestock)
- case studies of producers who have converted to organic production
- opportunities of assessment during work experience
- visit to a supermarket to see organic produce displayed for sale
- tutor support and mentoring.

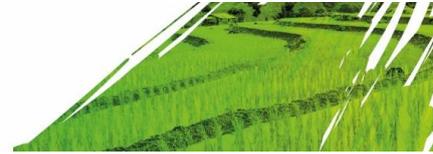
Learning aim A – Investigate the core principles of organic agricultural production and its ecological impact

As part of the introduction to the unit, facilitate a class discussion to establish the levels of knowledge and experience learners have about organic production.

- For learning aim A1, tutors could deliver a presentation with information on the historical background of food production in the last 100 years.
- Learners can work in pairs to discuss what they understand about organic production and the impact it has on a national economy.
- Learners can produce some facts about organic production and label them 'true' or 'false'. They could then question other members of the group to ascertain the facts about organic production.
- Learners could conduct online research into some of the key influencers of the organic farming movement (such as Stapledon, Steiner, Rusch, Lady Balfour and Sykes), looking into how they helped to develop organic systems. They can then share their findings with the rest of the class.
- Learners could undertake individual research, looking into the organic standards that producers must adhere to when producing organic food.
- Learners could investigate the meaning of 'permaculture' and produce a comparison of use of permaculture versus traditional resources. This activity will further develop learners' knowledge of different systems.
- Tutors could show a suitable video on the principles of organic production (health, ecology, fairness and care) and ask learners to take notes, which will form part of their summative assessment.
- Learners could produce a timeline that follows the conversion process from conventional production to organic production. These can be displayed in the classroom environment and used as an aide-memoire for when learners come to writing up their reports or presentations for the summative assessment.
- Tutors could take the learners to a marketplace to look at the labelling of organic food. Learners could collect pictorial evidence and bring this back to the classroom for a tutor-led

discussion. They can also identify the regulatory bodies and certification schemes involved in organic food production and look at the subscriptions available to producers.

- Tutors to deliver a presentation on the traceability of organic productions, covering separation, documentation, labelling and the inspection processes. Hold a Q&A session to answer any learner queries.
- For learning aim A2, learners could dig a soil pit in a conventional field and compare it to that of one in an organic field. They could then take soil samples from each and investigate the properties and structure of these in the centre's laboratory.
- Learners could assess the different samples of soil, testing these for texture, pH and soil type. They can also identify the various micro-organisms (such as bacteria and fungi) and macro-organisms (such as earthworms and nematodes) found in the samples.
- Learners could then write up this experiment in a report to further develop their understanding of soil management.
- For learning aim A3, learners could research the similarities and differences between green manures and organic manures in small groups. They can then work together to produce an information leaflet on the advantages and disadvantages of each type.
- Learners could create an annotated diagram of the effects of leaching on soil fertility. They could look at the factors that increase or decrease the incidences of leaching occurring.
- Learners could create a factsheet suitable for organic producers to use on the spreading periods for manures. This could have details on the current environmental legislation that governs the laws (i.e. closed seasons for spreading organic manures), as well as details and restrictions on fertiliser use such as external inputs.
- Learners could create a poster detailing the biological processes that affect organic production, e.g. the nitrogen cycle, carbon cycle and nitrogen fixation of leguminous plants. This will develop their knowledge about the relationship between nutrient needs of the plant and organic systems.
- For learning aim A4, learners can work in small groups to discuss sustainable agro-ecosystems. They can then present their information back to the group.
- Learners will benefit from a guest speaker, such as an organic producer, who can discuss the challenges faced when making the transition to organic production. This can also include threats to sustainable food production and ecosystem functioning caused by human impacts on soils and ecosystems, as well as anthropogenic effects.
- Learners can create a table comparing the similarities and differences between organic production systems and intensive production systems. They can then hold a debate on which system they think is the most effective and productive, with the tutor chairing.
- Learners can form into small groups and look at the associated links between the UK organic production systems and global organic systems, gathering information on the total numbers of producers and the commodities they produce. They can then produce a presentation, which they can deliver to the rest of the class as part of their formative assessment. Allocate time for learners to complete their summative assessment, which is a report or presentation evaluating the principles of organic production and the impact soil processes can have on agro-ecosystems.

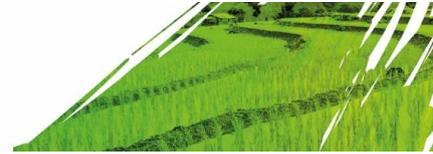


Learning aim B – Explore organic crop production methods in order to plan crop rotation

- For learning aim B2, learners could produce a plan of what they think should feature in a crop rotation, including a written statement outlining the reasons for crop rotation.
- Tutors could give learners copies of the centre's previous year's crop rotations, as well as an organic crop rotation, which they could then compare and note both the similarities and differences between the two rotations.
- Tutors could deliver a session on crop choice, discussing the diverse range of crops that can be grown in an organic system. This can include the reasons for crop rotation, the role of livestock and manures in crop rotation and the quality requirements. Learners could take notes and develop their knowledge on the principles of crop rotations by carrying out independent research.
- Learners could create their own crop rotation, offering justification as to why they have chosen the crops they have. They can then link their choices to learning aim B1, which focuses on soil management and the importance of this for healthy agro-systems. They can discuss how their crop choice will have benefits for the soil.
- Tutors could take learners to the field to observe cultivations taking place. Learners could assist in the completion of these cultivations and take pictorial evidence of how the cultivation method is helping with the management of the soil.
- Learners could form into pairs to research information on soil management and produce a 'top ten' list of how to manage soil, against a 'top ten' list of how not to manage soil. These lists can then be compared together as a class.
- Learners could draw a typical soil profile. They could then annotate this with information on soil problems, e.g. compaction, leaching, soil degradation and erosion, to further develop their understanding of soil management.
- Learners could produce an annotated diagram of how the living and non-living components of the ecosystem interact and explain the role of each one of these within the ecosystem.
- For learning aim B3, tutors could deliver a presentation on the potential problems with crop systems. They could show a video clip of the different methods of weed control used on organic systems. Learners could then compare these methods to conventional production and produce a chart mapping their comparisons.
- Learners could work in small groups to discuss pest and disease control. They could then produce a list of ways in which this can be done effectively without resorting to chemical means. Learners could then score each point they produce with how effective they think it will be, before discussing their thoughts together as a class.
- Tutors could take learners on a field walk and discuss the different cropping systems. They could verbally evaluate the impact that these systems have on nesting birds and other aspects of the ecosystem.
- Allocate time for learners to complete their summative assessment, which is a three-year crop rotational plan for two crop species and an animal management plan for one species.

Learning aim C – Explore organic livestock production methods in order to plan livestock management

- For learning aim C1, learners could produce an annotated diagram of the main livestock production areas in a country. They could then link the location of these to the choice of breed and discuss the impact on the environment.
- Tutors could deliver a presentation on the details of legislative and welfare guidelines. Ask learners to produce a best practice guide for organic producers so that they can manage livestock within the remit of the law.
Learners could annotate a map of the grazing area available and include details on stocking rates and different grazing systems that can be used in an organic system. They could then link this to the environmental impact these systems can have.
- Learners could produce a comparison table of grass-based systems that incorporate legumes in the grazing mix to one that does not. They could then look at the difference in soil quality, growth, yield and fertiliser use between the two systems, and discuss their thoughts as a class.
- For learning aim C2, tutors could deliver a session on the current market situation, including demand of markets and outlets, quality requirements and industry standards. Learners could then research the difference in market prices between organic and non-organic producers.
- Learners could produce a breeding plan for a flock or herd of animals. This could include details on the timing of mating, sires used, open and closed systems and the timing of weaning, in order to give learners an understanding of the production cycle.
- Learners could produce a good proactive guide on biosecurity, including details regarding how producers can prevent the spread of a disease outbreak and zoonoses within their herd or flock.
- A guest speaker in the form of a veterinary surgeon could be invited to speak to the learners about the role of veterinary medicine in organic production. Learners can then take notes and incorporate these into their summative assessment.
- A representative from an animal health supplier could also give a lecture on the role of preventative medicine use in organic systems. Learners can then take notes and incorporate these into their summative assessment.
- Tutors could show learners a video clip of the complementary therapies available to organic producers. Tutors can hold a Q&A session so that learners can ask any questions and consolidate their learning.
- Learners could produce a comparison on the advantages and disadvantages of complementary therapies for animals, and then discuss their thoughts as a class.
- For learning aim C3, learners could visit a feed mill to see first-hand the production of organic feedstuffs and the processes it goes through. They could take photographs and notes, and then create a flow diagram of the process from raw ingredient through to a saleable product.
- Learners could look at the different samples of feedstuffs, both organic and non-organic, and visually appraise these. They could then note the differences and interpret the detail on the feed labels ensuring that they understand the difference on each of the labels.
- Learners could then produce a report on home-saved feeds, detailing what they could entail and the benefits they have in a feeding system. They could then create a rationale for the use of these in an organic system, justifying their reasons in a presentation.
- Allocate time for learners to complete their summative assessment, which is a three-year crop rotational plan for two crop species and an animal management plan for one species.



Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links to:

- Unit 1: Plant and Soil Science
- Unit 7: Work Experience in the Land-based Sectors
- Unit 15: Livestock Health and Diseases
- Unit 17: Crop Production.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Internationals in Agriculture/Horticulture/Land-based subjects. Check the Pearson website ([qualifications.pearson.com/endorsed-resources](https://www.pearson.com/endorsed-resources)) for more information as titles achieve endorsement.

Textbooks

Balfour EB, *The Living Soil*, Universe Books, 1976 ISBN 9780876632697 – a useful guide to soil, including detail on organic soils

Blake F, *Organic Farming and Growing: A Guide to Management* (3rd Edition), The Crowood Press, 1994 ISBN 9781852238384 – a detailed resource looking at the management of organic crop and livestock production

Conford P, *The Origins of the Organic Movement*, Floris Books, 2001 ISBN 9780863153365 – an insight into how organic production has developed and how the principle of organic production began

DEFRA, *Fertiliser Recommendations for Agricultural and Horticultural Crops* (8th Edition), The Stationery Office Books, 2008 ISBN 9780112430582 – a grower's guide to fertiliser recommendations for crop production, including application of organic livestock manures

Finch H, Samuel A, Lockhart J and Wiseman A, *Lockhart and Wiseman's Introduction to Crop Husbandry: Including Grasslands* (7th Edition), Butterworth-Heinemann, 1993 ISBN 9780080420028 – a comprehensive book on crop husbandry, including organic production

Lampkin N, *Organic Farming* (2nd Edition), Old Pond Publishing, 2002 ISBN 9781903366295 – a highly detailed book looking at all aspects of organic production

Nix J, *Farm Management Pocketbook*, The Andersons Centre, 2009 ISBN 9780954120153 – a guide to the financial returns expected from organic crop and livestock production systems

Soffe R, *The Agricultural Notebook* (20th Edition), Blackwell Science, 2003 ISBN 9780632058297 – a detailed book covering all aspects of agricultural production, including organic crop and livestock production and practices

Journals

Journal of the British Grassland Society (Blackwell Scientific Publications) – for information on grass and grazing management

Farmers Guardian (Reed Publishing) – for technical updates and news

Farmers Weekly (Reed publishing) – for information on farming

Journal of Soil and Water Conservation (Soil and Water Conservation Society) –
Regular news and features about soil and water conservation

Videos

'AHDB Horticulture (Agriculture and Horticulture Development Board)' – click on the 'Knowledge Hub' tab and then 'Video hub' for videos on growing field vegetables from establishment to harvesting.

Websites

'Agriculture and Horticulture Development Board (AHDB)' – an interactive website with up-to-date commodity prices and useful management tools

'Farmers Weekly' – a website dedicated for the farmer with up-to-date articles on organic crop and livestock production

'Linking Environment and Farming (LEAF)' – a website with a vast amount of detail on environmental issues and information on crop and livestock production systems and how these can be integrated

'Organic Farmers and Growers' – via online search engine, look for 'ofgorganic.org' for a leading UK website with details of organic certification and Regulatory bodies, focusing on organic production.

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling learners to access them through the school/college intranet.