



Industry Guide to Good Hygiene

Watercress

A guide to safe production of watercress

2017

Recognised by



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Forewords



This industry guide provides watercress growers with practical advice on how to comply with food hygiene legislation and related requirements. This guide is officially recognised by the Food Standards Agency (FSA), which has responsibility for food safety in England, Wales and Northern Ireland and Food Standards Scotland (FSS) with responsibility for food safety in Scotland. Use of this industry guide is optional and food business operators can choose to comply in other ways. However, where a food business operator is following the guidance in a recognised industry guide, the enforcement authority must take this into account when assessing compliance with legislation. The information within this guide will help watercress growers meet their legal obligations and ensure food safety. The use of industry guides supports the proportionate, consistent and effective application of food hygiene in the UK, and FSA and FSS fully support their development. The FSA and FSS would like to thank the Watercress Industry Working Group for preparing this guide.

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Watercress Industry Working Group Members

- James Ambrose (Food Standards Agency)
- Charles Barter (The Watercress Company) – Chairman
- Ollie Bedford (The Watercress Company)
- Kim Brown (Vitacress)
- Grace Choto (AHDB)
- Tim Evans (Dorset County Council)
- Kevin Gosling (Winchester City Council)
- Dr Jim Monaghan (Harper Adams University) - Author of the guide
- Dr Steve Rothwell (Vitacress)
- Edward Scales (Hairspring Watercress)

1 Introduction

1.1 About this guide

The guide provides information on legal obligations for growers of watercress and what they need to do in order to comply with food hygiene law, as well as other aspects such as best practice, which are not legal requirements, but are likely to contribute to the overall achievement of food safety. This guide has been developed by an expert group and is recognised by the Food Standards Agency and Food Standards Scotland in accordance with Article 8 of Regulation (EC) No. 852/2004.

You are not legally obliged to follow this guide and may choose other ways to meet the regulations if you wish. However, you are encouraged to use the guide on a voluntary basis. The guide has no legal force and its use by watercress producers is not obligatory, but Local Authority enforcement officers are required to take account of its contents when carrying out an inspection of your business. This guide deals only with requirements of Regulation (EC) No. 852/2004 and the relevant parts of associated UK Food Hygiene Regulations.

This guide refers to watercress grown in gravel beds with pathogen-free flowing water, commonly sourced from underground aquifers. The crop is generally grown outdoors in constructed beds. The risks of contamination are similar to other outdoor grown crops, such as wildlife and pests, and focus is required on managing the risks associated with potential contamination of the water source.

1.2 How to use this guide

The guidance is laid out in the following pages in a format designed to allow producers to determine quickly whether their current or proposed arrangements comply with Food Hygiene Regulations. The guidance is laid out in three areas:

“The Law” – This quotes the specific legal requirement.

“How to comply with the law” – This outlines actions or arrangements considered sufficient to comply with the law. Other means of compliance may be implemented by producers, but additional validation may be necessary in such cases.

“Best practice” – This outlines best practice arrangements that producers may want to implement. Where they are implemented, they should be additional to the arrangements mentioned in “how to comply”. These arrangements go beyond the requirements of the law.

The guide has been laid out in a format to allow producers to find the guidance they seek easily. As a consequence, legal requirements quoted in “The Law” may appear in more than one place, and appropriate additional guidance may be found elsewhere in the document. Other guidance is available from government agencies and other reliable sources. Web addresses for many of these can be found in Annexe 1.

1.3 Legal compliance and due diligence

Implementing the requirements of “How to comply with the law” as set out in this guidance ought to be sufficient to satisfy the conditions for a business to achieve the top rating in the respective national Hygiene Ratings Scheme. In the event of a food safety contravention, businesses may wish to use the due diligence defence. This defence can only be assessed by courts according to the facts of any particular case. Following this guide may assist. Where the guide provides lists of examples that comply with the law, these lists are not exhaustive and other examples may be equally satisfactory.

1.4 Scope of this guide

This guide applies to watercress (*Nasturtium officinale*) that is grown commercially in flowing water. This guide covers hygiene standards for the **primary production of fresh and unprocessed watercress** and encompasses the legal obligations and best practice observations for crop production, harvesting and storage with additional guidance on the hygiene requirements for seed production and plant propagation.

The guide does not cover the management of a packing operation or processing practices that substantially change the nature of the product, which commonly include washing, rinsing, dewatering and bagging in modified atmosphere packaging.

1.5 Relevant legislation

Regulation (EC) 178/2002 requires that all food placed on the market must be safe to eat and defines requirements for traceability.

Reg. 852/2004 on the hygiene of foodstuffs and particularly Annex I – Primary Production, Part A: General hygiene provisions for primary production and associated operations. This directly addresses the legal requirements for primary production and is the core of this guide.

Reg.1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation). This regulation applies to the use of composted or heat-treated natural fertilizers derived from animal waste, such as manure.

There are a number of national regulations that are involved in the implementation of these requirements that are also listed in the Appendix.

1.6 Glossary

Clean water does not compromise food safety in the circumstances of its use. The definition includes brackish water that does not contain micro-organisms, harmful substances or toxic marine plankton in quantities capable of directly or indirectly affecting the health quality of food and fresh water of a similar quality (Regulation (EU) No 852/2004).

Plant protection products: (PPP) are 'pesticides' that protect crops or desirable or useful plants. The most common use of pesticides is in the form of PPPs. They are primarily used in the agricultural sector but also in forestry, horticulture, amenity areas and in home gardens. The term 'pesticide' is often used interchangeably with 'plant protection product'.

Post-harvest: is the stage of watercress production after harvest and includes cooling, cleaning, sorting and packing.

Potable water: is water which meets the requirements laid down in Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption. This includes a critical value for E.coli of 0 in 250 ml.

Pre-harvest: incorporates all activities on the farm that occur before watercress is harvested.

Primary Production: means the production or growing of primary products including harvesting as defined in Regulation (EC) No 178/2002 and associated operations defined in Regulation (EC) No. 852/2004, including the transport, storage and handling of primary products at the place of production, provided that this does not substantially alter their nature; and transport operations to deliver primary products, the nature of which has not been substantially altered, from the place of production to an establishment.

2 Primary production of watercress

Primary production encompasses seed production, propagation of seedlings and production of the crop through to harvesting and handling. Microbial contamination of the crop during production, harvest and storage could lead to contaminated watercress crops that have the potential to cause foodborne illness in consumers. Proper consideration of the risks of microbial contamination of watercress during production will reduce the risk of microbial contamination in the harvested crop.

In general, the approach is similar for all stages of production but additional guidance is included for seed production (Section 3) and young plant propagation (Section 4).

The Law

Reg. 852/2004, Annex I; II.2, II.3(a); II.5(e); III.7

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (e) as far as possible to prevent animals and pests from causing contamination;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

2.1 Site risk assessment

Production sites must be managed to minimise the probability of microbial contamination to the watercress beds from adjacent land. Where plants are propagated in substrate, propagation sites (indoor and outdoor) should be located and maintained to minimise the probability of microbial contamination to the growing plants.

How to comply with the law

The risks of contamination of production areas must be assessed in a site risk assessment, recorded and the records available for inspection. The risk assessment must be completed by a competent team or individual.

The risk assessment must include:

- Access by animals (domestic or wild) to the production area.
- Access of animals (domestic or wild) to water sources used in primary production and associated operations.
- Leaking, leaching or overflowing manure storage areas close to production areas.
- Hazardous waste sites close to production areas (currently and in the past).
- Sewage treatment sites and septic tanks close to production areas (currently and in the past).
- Industrial or mining sites close to production areas (currently and in the past).
- Possibility of runoff from nearby fields and adjacent on-site tracks and roadways.
- Possibility of flooding site with contaminated water.
- Possibility of contamination of the production area with microbial or other environmental hazards, for example, faecal material, aerosols or organic waste.

Best Practice

- The site risk assessment should be reviewed annually.
- Staff training should be included in the site risk assessment.
- The site risk assessment should be reviewed if the situation changes i.e. land use changes on land adjacent to the production area.

The Law

Reg. 852/2004, Annex I, Chapter II. 3(a), III.7

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

2.2 Protecting the site from contamination

Watercress production beds are longstanding facilities and the level of risks posed by adjacent land may change over time. It may be necessary for a producer to mitigate environmental risks identified from adjacent land. Incursion by livestock and wildlife are covered in section 2.9.

How to comply with the law

Where the surrounding environment presents a risk to the production site and has been identified in the site risk assessment (2.1.), measures must be implemented to minimise the contamination of the production area and the growing crop. The measures put in place to control hazards must be recorded and available for inspection.

Best Practice

Runoff from adjacent land may be redirected through the Landscape changes such as:

- A shallow ditch, raised bank (e.g. sleeping policeman) or wall to channel water away to a drainage point. These barriers may run the length of the production beds.
- A long grated drain across a roadway or track.
- Rerouting of traffic access routes from roads, tracks and other rights of way away from the beds.

The Law

Reg.1069/2009, Chapter 2, Section 2, Article 32.1(a), (b), (c)

1. Organic fertilisers and soil improvers may be placed on the market and used provided:

(a) they are derived from Category 2 or Category 3 material; (b) they have been produced in accordance with the conditions for pressure sterilisation or with other conditions to prevent risks arising to public and animal health, in accordance with the requirements laid down pursuant to Article 15 and any measures which have been laid down in accordance with paragraph 3 of this Article; (c) they come from approved or registered establishments or plants, as applicable;

Reg. 852/2004, Annex I, Chapter II. 3(a). III.7

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

2.3 Natural fertilisers

Natural fertilisers derived from animal manure may be used in some production systems to encourage growth of watercress. It is important to manage the risk of introducing microbial hazards through these materials.

How to comply with the law

Where fertilisers derived from animal products are applied to a crop they must only be used if they have undergone suitable treatment to achieve a high level of potential pathogen reduction. The method of treatment must be recorded. Composting must be verified by testing for faecal pathogens before use either by the composted material supplier or by the primary producer. Storage of faecal derived material must be managed to prevent contamination of the growing crop. Compost analysis and treatment records must be available for inspection.

Best Practice

- A microbiological analysis or a Certificate of Compliance from any natural fertiliser supplier should be available for each batch of material brought on to the primary production site.

The Law

Reg. 852/2004, Annex I, Chapter III. 7, 9 (a)

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (a) any use of plant protection products and biocides;

2.4 Plant protection products and synthetic fertilisers

Although this production guide is focussed on microbial hazards, the use of plant protection products (PPP) and synthetic fertilisers may pose a risk to consumers if not approved for use on human food crops.

How to comply with the law

PPP and synthetic fertilisers must be acceptable for human food crops. Records must be kept of the application applied and be available for inspection.

The Law

Reg. 852/2004, Annex I, Chapter II.2, II.3 (a), II.5 (b),(c),(e)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products; (c) to use potable water, or clean water, whenever necessary to prevent contamination; (e) as far as possible to prevent animals and pests from causing contamination;

2.5 Water quality

Watercress is grown in flowing water during production up to harvest and poses a direct risk if the water is contaminated with microbial pathogens.

How to comply with the law

All sources of water used in primary production must be known (e.g. bore hole/well, spring and reservoir) for all uses including production beds, propagation, PPP application, cleaning of equipment etc. The distribution systems and storage of water must be known and mapped. The sources of water must be protected from contamination. The microbial quality of the water sources must be monitored and records kept over time (See section 2.11.1.). The water used to produce watercress must not contain micro-organisms or harmful substances in quantities capable of directly or indirectly leading to illness in consumers.

Best Practice

- Open water sources with a variable microbial quality e.g. rivers and ponds, pose an unacceptable risk and should not be used for watercress production.
- There should be a recorded risk assessment completed by a competent risk assessor where all water sources are identified and potential contamination to the water is considered and preventive action proposed.
- All water sources should be tested to establish the microbial quality.
- The frequency of testing may vary according to the scale of the business:
 - For a small grower with a single water source best practice may be to test the water source twice a year spread equally across the production season.
 - For a large grower many water sources can be present on each farm, all deriving from the same aquifer. In this case each farm should have its water tested monthly from the season start, but the boreholes selected may be rotated to ensure that each source is tested 4 times per year.
- Samples should be taken from the inlet into the production bed from each water source at regular intervals.
- Water is tested for generic *E coli* as an indicator species (see Section 2.11.1).
- Water test results should be trended and available (see Section 2.11.1).

The Law

Reg. 852/2004, Annex I, Chapter II 5 (a), (b); III 7.

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (a) to keep clean and, where necessary after cleaning, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels; (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

2.6 Equipment associated with growing and harvesting

Inadequate maintenance and cleaning of watercress growing and harvesting equipment could lead to an accumulation of pathogens which can cross contaminate the harvested crop. Equipment includes knives, boxes/crates and machinery that come into contact with the crop during growing or harvesting.

How to comply with the law

Equipment must be cleared of debris before use, cleaned and disinfected. The cleaning and disinfecting procedure must be defined and recorded, and records available for inspection. Cleaning of equipment must be carried out in designated area outside the production area to prevent contamination of the growing crop or pollution of associated watercourses. Field boxes and product containers must be suitable for contact with food, only be used to hold the product and be routinely cleaned and disinfected. Equipment must be stored in a manner that minimises contamination.

Best practice

There should be a defined written cleaning and disinfecting procedure for all growing and harvesting equipment. This should cover:

- All cleaning/disinfection procedures including daily cleaning and weekly deep cleaning, where equipment can partially be dismantled and belts removed to facilitate effective cleaning.
- The identification of appropriate cleaning/disinfection chemicals and dilutions for effective use and used as directed by the manufacturer i.e. contact times and rinsing.
- Training records should be available for all staff who undertake the cleaning and disinfection.
- The effectiveness of the cleaning and disinfection should be verified through records of environmental swabbing on equipment surfaces that come into contact with the harvested crop.

A **small grower** may harvest watercress into boxes/crates using knives:

- Knives used for harvesting should be cleaned and sanitised before and after use and stored away from contamination risks.
- Harvest crates should be kept clean and stored away from contamination risks.

A **large grower** may harvest watercress into boxes/crates using a mechanical harvester:

- Harvest machinery should be designed to make it as easy to clean as possible.
- Harvesting machinery should be deep cleaned daily by trained staff following a detailed written cleaning procedure.
- Weekly swabs should be taken from the main product contact surface (the main belt and blade) and analysed for total coliforms.
- In addition, the machine should be swabbed for listeria after cleaning every month (from the blade and from the belt after it has been run for 10 minutes).
- Harvest crates should be cleaned through a hot water crate washing machine prior to each use.
- Crates should be swabbed monthly for total coliforms to verify the efficacy of cleaning.

The Law

Reg. 852/2004, Annex I, Chapter II 5 (a), (b)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (a) to keep clean and, where necessary after cleaning, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels; (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products;

2.7 Storage, handling and transport

Watercress is commonly hand or machine harvested into field crates. The harvested material may then be taken to a separate area for removal of field heat, prior to distribution.

2.7.1 Storage

Harvested material may be stored for a period of time in a refrigerated store.

How to comply with the law

Harvested watercress must be stored away from chemicals, animals and other sources of contamination and must be moved to a processing or packing facility as soon as possible.

Best Practice

The harvested watercress should be held in an area designated for crop storage.

2.7.2 Post-harvest temperature controls

Reduced temperatures minimise the growth of microbial contaminants on fresh produce and robust chill/cool chain procedures are an important preventive action and if correctly followed can help to ensure hygienic production, transport and storage conditions.

How to comply with the law

The method used to remove the field heat from the harvested batches must not pose a risk to the crop and any water used in the cooling process must be of acceptable microbial quality (see 2.11.1).

Best practice

- A system of monitoring the temperature of the storage environment and the watercress should be in place.
- The harvested batches should be at or below 5 °C within 4 hours of harvest.
- **Small growers** may use room cooling or a refrigerated unit on a truck followed by icing.
- **Large growers** may use precooling systems such as a vacuum cooler.

- Watercress should be maintained at <5 °C during storage.
- Bulk-stored watercress can generate heat even in a refrigerated store and must be monitored and re-cooled as necessary

2.7.3 Transport requirements

Some watercress will be transported from the production site to the next stage in the supply chain in vehicles that are not managed by the producer. However, in some cases businesses may have responsibility for transporting watercress to the next stage of the supply chain e.g. delivering watercress in business-managed vehicle to a wholesale distributor.

How to comply with the law

Loading and transportation must be carried out in a manner to minimise damage and contamination of the watercress. Transport equipment/containers and vehicles must be kept clean. Harvested watercress must be protected against contamination during transport.

Best practice

Small growers may manage one or two vehicles for delivering watercress to customers.

- Watercress should be transported in refrigerated trucks.
- The refrigeration units on the trucks should be serviced regularly.
- The interior of the trucks should be kept clean.

Large growers may manage a number of vehicles for transporting watercress.

- Watercress should be transported in refrigerated trucks.
- The refrigeration units on the trucks should be serviced regularly.
- All transport should be cleaned according to a written procedure and the cleaning recorded.
- The vehicles should be checked for cleanliness and temperature prior to loading.

The Law

Reg. 852/2004, Annex I, Chapter 5 (a), (b)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (a) to keep clean and, where necessary after cleaning, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels; (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products.

2.8 Cleaning maintenance and disinfection of watercress handling areas

Watercress may be handled following harvesting and before distribution. The tasks involved may include grading, washing, cooling and storing.

How to comply with the law

Premises and re-usable equipment must be kept in a good state of repair and in a condition to facilitate cleaning and where appropriate disinfection. Programmes must be in place to ensure that any necessary cleaning and maintenance is carried out effectively and appropriately. Cleaning and disinfection of handling areas must be carried out in a manner that will not cause the harvested crop or production areas to be contaminated.

Best Practice

- There should be a schedule for cleaning and disinfection of all relevant equipment and areas.
- The schedule should cover both daily cleaning and weekly deep cleaning, where equipment can be partially dismantled to facilitate effective cleaning.
- Cleaning should include removing debris, detergent, rinse with clean water and if appropriate disinfect following manufacturers' instructions (dilution rates, contact times and rinsing).
- There should be clear identification of appropriate cleaning chemicals and dilutions for effective use.
- All cleaning procedures should be recorded including daily cleaning and weekly deep cleaning.
- Training records of all staff who undertake the cleaning and disinfection should be available for inspection.
- The effectiveness of the cleaning and disinfection should be verified through records of environmental swabbing on equipment surfaces that come into contact with the harvested crop.

The Law

Reg. 852/2004, Annex I, Chapter II.2, II.3 (a), And II.5 (e), III. 7, 9 (b) (c)

2 As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (e) as far as possible to prevent animals and pests from causing contamination;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (b) any occurrence of pests or diseases that may affect the safety of products of plant origin;

2.9 Pest control in growing, propagation and handling areas

Livestock, wildlife and domestic animal activity may pose a risk to watercress beds and adjacent land through faecal contamination where potential microbial contaminants are present in the faeces. The challenge for producers is similar to that of other outdoor field grown salad leaf crops.

Watercress has a particular challenge in that the flowing water in the beds may spread contamination more widely though the growing crop. Watercress can be contaminated by liver fluke through faecal contamination of the production area and the associated presence of mud snails (*Lymnea truncatula*/*Galba truncatula*), which are hosts to liver fluke.

Different strategies may be required for mammals (such as rabbits or deer), birds (such as ducks and geese) and mud snails.

How to comply with the law

The producer must assess the risk of access to the production area from livestock, domestic or wild animals in the Site Risk Assessment (2.1.). If the assessment highlights an unacceptable risk, preventive actions must be put in place. Incursion into the crop by livestock or wildlife including water fowl that requires remedial action, such as non-harvesting of crops, must be recorded, and the records be made available for inspection. Staff involved in production must be trained to report the presence of significant incursion.

Best Practice

2.9.1 Animals

- Where a risk is identified there must be barriers, such as amphibian, rabbit and deer proof fencing to prevent domestic and wild animals entering production area.
- Cattle grids should be at all access points to the site adjacent to livestock areas.
- Where public footpaths are adjacent to the production area, there should be clear signage marking the area as a food production site
- Where possible potential entry into the crop by the public and/or pets should be prevented.

- Managed pest control through shooting can reduce the pest pressure in some circumstances.

2.9.2 Birds

- Bird scarers should be used to minimise bird activity in the production area, this may include the use of hawks to fly over the site.
- Managed pest control through shooting can reduce the pest pressure in some circumstances.

2.9.3 Mud snails

- Production beds should be bounded by either a 3 m well drained gravel (or similar material) track or minimum 1 m wide water course not bridged by vegetation, neither of which it is believed the snail can transit, to prevent ingress of mud snails which may be present on neighbouring land.

The Law

Reg. 852/2004, Annex I, Chapter 5 (b), (c), (d)

Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (b) to ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products; (c) to use potable water, or clean water, whenever necessary to prevent contamination; (d) to ensure that staff handling foodstuffs are in good health and undergo training on health risks;

2.10 Personnel health and hygiene and sanitary facilities

Watercress may be handled by workers during production, harvesting and post-harvest procedures.

2.10.1 Worker Hygiene

It is important the hazards posed by poor personal hygiene are managed in a way that reduces the contamination risk to the watercress

How to comply with the law


All workers must be trained in basic hygiene procedures and understand the importance of following hygiene guidelines. Non-essential persons and casual visitors must be prevented from accessing the harvest area and other crop production areas, e.g. watercress beds, without authorisation. Where a significant risk is posed by workers handling the crop, appropriate hand washing procedures must be implemented, with workers washing their hands before starting work if handling the growing or harvested crop and after using the toilet or handling any contaminated material.

Appropriate protective equipment must be worn by all staff involved in watercress production and harvesting. When protective equipment is used within the crop production area it must be in an acceptable condition and clean.

Fixed or mobile toilet and hand wash facilities must be available in a location that can be accessed by workers but that does not pose a contamination risk to the production area. The facilities must be used by staff and in an acceptable condition and routinely cleaned. There must be sufficient provision of toilet and hand wash stations for the numbers for staff involved in crop production and harvesting. Areas must be provided away from the field and crop handling areas for workers to take breaks and to eat.

Best Practice

- Clear signage instructing employees to wash their hands should be posted visibly in appropriate areas.

- 
- One hand-washing station should be available for every 10 people working.
 - Toilets should be located within 500 m or 5 minutes' travel from the production area.
 - Sanitising gel should be available following handwashing.
 - Drinking water should be available separately from hand washing or toilet facilities.
 - Waste containers should be emptied regularly.
 - Boots should be free of visual soiling before entering the crop production beds. This can be achieved through washing and rinsing with clean water ensuring any run off does not enter the beds.
- DRAFT

The Law

Reg. 852/2004, Annex I, Chapter 5 (d)

Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (d) to ensure that staff handling foodstuffs are in good health and undergo training on health risks;

2.10.2 Health status

Workers who have a gastrointestinal illness may contaminate the production area or harvested watercress.

How to comply with the law

There must be a defined policy in place for handling workers with gastrointestinal diseases. Workers must be aware that they should not work in contact with watercress if they feel sick. Illnesses must be reported to management in line with reporting procedures. Anyone known to be suffering from a gastrointestinal disease must not be allowed into the field or in any handling area if there is a risk of contaminating the growing or harvested crop.

Best Practice

- All visitors on site should be made aware of and follow hygiene guidelines
- Training records covering declaration of illness and return to work procedures should be available for all staff.
- Defined and managed return to work procedures should be in place for staff who have been ill.
- Boils or septic skin lesions, cuts and wounds should be covered in brightly coloured, food grade adhesive dressings.
- Where necessary, plasters should be metal detectable.

The Law

Reg. 852/2004, Annex I, Chapter II.2, II.5 (c), (g); Chapter III. 7, 9 (c)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (c) to use potable water, or clean water, whenever necessary to prevent contamination; (g) to take account of the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

2.11 Microbial analysis

There are currently no legal critical values for microbial contamination of agricultural water or harvested product but testing is an essential component of food safety management in the production of watercress.

2.11.1 Water

The approach that a business should take to managing water quality is covered in Section 2.5.

How to comply with the law

The water used in production of the crop must not contain levels of micro-organisms or harmful substances in quantities that will pose a food safety risk to consumers. Records must be available for inspection.

Best Practice

- A schedule of testing should be in place for all water sources, which defines frequency of testing and organisms to be tested.
- Testing should be carried out by independently accredited laboratories (e.g. ISO /IEC 17025:2005).
- Water test results should be trended to monitor water quality over time and records should be kept for 5 years.
- Water should be in specification for indicator organisms (Generic E. coli):
 - Target <10 cfu / 100 ml
 - Acceptable 10-100 cfu / 100 ml
 - Unacceptable >100 cfu / 100 ml
- If the water test results are not satisfactory, corrective actions should be recorded.

The Law

Reg. 178/2002. Chapter 2, Section 4, Article 14. 1, 2(a)

1. Food shall not be placed on the market if it is unsafe. 2. Food shall be deemed to be unsafe if it is considered to be: (a) injurious to health;

Reg. 852/2004, Annex I, Chapter, II.5 (g); Chapter III. 7, 9 (c)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (g) to take account of the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

2.11.2 Harvested watercress

Watercress shall not be placed on the market if it is unsafe i.e. is considered to be injurious to health.

How to comply with the law

Watercress placed on the market must not be injurious to health. Records must be available for inspection.

Best practice

- A schedule of testing should be in place for harvested watercress, which defines frequency of testing, organisms to be tested.
 - **Small growers** may not test harvested watercress.
 - **Large growers** would be expected to test harvested watercress.
- Testing should be carried out by independently accredited laboratories (e.g. ISO /IEC 17025:2005).
- Harvested watercress should be routinely sampled, ideally weekly throughout the growing season.
- Samples should be tested for levels of generic E. coli and Listeria.
- Watercress test results should be trended to monitor microbial quality over time and records should be kept for a minimum of 1 year.
- Data may be plotted on mapping software to show visual spread of detections to assist in identifying any potential problem areas.
- If the product test results are not satisfactory, corrective actions should be recorded.

The Law

Reg. 178/2002 Chapter 2,
Section 4, Article 18. 1-4.

1. The traceability of food, [...] and any other substance intended to be, or expected to be, incorporated into a food [...] shall be established at all stages of production, processing and distribution.

2. Food [...] business operators shall be able to identify any person from whom they have been supplied with a food, [...] or any substance intended to be, or expected to be, incorporated into a food [...]. To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.

3. Food [...] business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.

4. Food [...] which is placed on the market or is likely to be placed on the market in the Community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.

2.12 Traceability

The ability to trace batches of crop through the supply chain enables products associated with food safety issues to be swiftly removed from the food chain and the source of issues to be identified.

How to comply with the law

Traceability records must be in place which enable the tracing of watercress one step back and one step forward in the supply chain. Records must be available for inspection.

Best practice

- Growers should have an identity reference for each cropping bed.

The Law

Reg. 178/2002, Section 4, Article 19

1. If a food business operator considers or has reason to believe that a food which it has imported, produced, processed, manufactured or distributed is not in compliance with the food safety requirements, it shall immediately initiate procedures to withdraw the food in question from the market where the food has left the immediate control of that initial food business operator and inform the competent authorities thereof [...].

2.13 Recall procedures

How to comply with the law

Formal withdrawal and recall procedures must be in place.

Best practice

- Customers should be aware of the withdrawal and recall procedures employed by the primary producer.

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2.14 Food crime

If you have suspicions or concerns that food crime is taking place in the watercress supply chain, these should be reported to either The National Food Crime Unit (NFCU), covering England, Wales and Northern Ireland, or the Scottish Food Crime and Incidents Unit (SFCIU).

Food crime is dishonesty in food production or supply, which is either complex or results in serious harm to consumers, businesses or the overall public interest.

Both the NFCU and SFCIU are committed to identifying and tackling serious criminal threats to UK food, drink and animal feed. Both units share a commitment to working with others across all sectors to encourage reporting, prevent offending and to bring those responsible to justice.

At the following web addresses, you can find out how to report information and learn more about the Units, including the Food Crime Annual Strategic Assessment.

Reporting food fraud (England, Wales and Northern Ireland):
www.food.gov.uk/enforcement/the-nationalfood-crime-unit

Reporting food fraud (Scotland):

<http://www.foodstandards.gov.scot/food-safety-standards/regulation-and-enforcement-food-laws-scotland/food-fraud>

The Law

Reg. 852/2004, Annex I, Chapter III. 5(d)

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (d) to ensure that staff handling foodstuffs are in good health and undergo training on health risks;

2.15 Training

Staff training in safe food handling is important for those workers involved in all aspects of watercress production.

How to comply with the law

All staff handling the crop must have been trained in personal hygiene and safe food handling practices, this must include temporary or contract staff.

Best practice

- Staff training should be relevant to the level of work
- All crop-handling personnel must undertake some form of basic food hygiene training and be suitably supervised or instructed.
- Training does not always have to be by a formally recognised course and training may be delivered in-house.
- Staff must undergo refresher training at appropriate intervals.

The Law

Reg. 852/2004, Annex I, Chapter II.3 (a), II.5 (e), III. 7.

3. [...] food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (e) as far as possible to prevent animals and pests from causing contamination;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

3 Growing watercress for seed production

If seeds have been contaminated during production or storage of the seed crop, they may introduce microbial hazards to the harvested crop. The hygiene requirements for the production of seed crops is the same as for the stages of crop production outlined in Section 2. In addition, the following specific areas need to be considered.

3.1 Seed storage area

Insects and mammalian pests such as rodents can transfer pathogens to seeds whilst in storage. They also damage the seeds and can make them more susceptible to contamination.

How to comply with the law

Buildings must be kept in good repair to limit access to pests and eliminate potential breeding sites. Stored seeds must be inspected to ensure seeds damaged or contaminated by insects/rodents are not used. Buildings should be regularly checked for infestation and records kept of inspections. Records must be available for inspection.

Best practice

- Infestations should be controlled immediately.
- Methods used to control pests should not affect the safety of the seeds.
- Holes, drains and other places where pests are likely to gain access should be kept sealed.
- Wire mesh screens should be used on open windows, doors and ventilators.
- Seed should be kept in a secured and designated storage area.

The Law

Reg. 178/2002 Chapter 2,
Section 4, Article 18, 1-3

1. The traceability of food, [...] and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.

2. Food [...] business operators shall be able to identify any person from whom they have been supplied with a food, [...] or any substance intended to be, or expected to be, incorporated into a food or feed.

3. Food [...] business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.

3.2 Seed traceability

If seeds have been contaminated during production or storage, before being used for a crop, they may introduce microbial hazards to the harvested crop.

How to comply with the law

Traceability records must be in place which enable the tracing of watercress seed one step forward and one step back in the supply chain. Seed suppliers must be able to identify the businesses they have supplied with seeds. Records must be kept and available for inspection to enable traceability to a single batch. The system must enable batches to be retrieved i.e. a system to recall batches from other producers supplied and a system to properly dispose of recalled seeds.

Best practice

- If producing seed, growers should have an identity reference for each seed crop and be able to trace the seed lot used.

The Law

Reg. 178/2002 Chapter 2,
Section 4, Article 18, 1-3.

1. The traceability of food, [...] and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.

2. Food [...] business operators shall be able to identify any person from whom they have been supplied with a food, [...] or any substance intended to be, or expected to be, incorporated into a food [...].

3. Food [...] business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.

Reg. 852/2004, Annex I; II.2;
III.7

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

4 Production of seedlings (propagation)

Watercress crops may be grown from seed placed directly into the bed or grown from seedlings. The hygiene requirements for the production of seedlings is the same as for the stages of crop production outlined in Section 2. In addition, the following specific areas need to be considered.

4.1 Propagation material traceability

Some foodborne illness outbreaks in fresh produce have been linked to seed contamination. Isolating bacteria from contaminated seeds is inconsistent with available technologies and microbial testing of seeds cannot be relied on to ensure that seeds are free of contamination. As such, it is important to know that seeds have been produced to the same standards as a crop for consumption.

How to comply with the law

The source of watercress seeds and seedlings must be known and the material must have been produced following the same standards as a commercial crop for consumption that reduces the risk of microbial contamination during production. Where seeds and/or propagation material have been tested for microbial quality, records must be maintained and be available for inspection.

Best Practice

- Records should be available that identifies each batch of propagation material (seeds and seedlings), whether they are bought-in or produced within the business.
- Seed should be sourced from an approved, known, traceable supply chain
- Seed production practices should be demonstrated as being compatible with the production guidelines in Section 2.
- Where seed is bought-in, seed suppliers should provide a certificate of compliance with the production guidelines in Section 2 with each seed batch.

The Law

Reg. 852/2004, Annex I; II.2, II.3(a), II.5 (c), (g); III.7, 9 (c)

2. As far as possible, food business operators are to ensure that primary products are protected against contamination, having regard to any processing that primary products will subsequently undergo.

3. [...], food business operators are to comply with appropriate Community and national legislative provisions relating to the control of hazards in primary production and associated operations, including: (a) measures to control contamination arising from the air, soil, water, feed, fertilisers, [...] plant protection products and biocides and the storage, handling and disposal of waste;

5. Food business operators producing or harvesting plant products are to take adequate measures, as appropriate: (c) to use potable water, or clean water, whenever necessary to prevent contamination; (g) to take account of the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health;

7. Food business operators are to keep and retain records relating to measures put in place to control hazards in an appropriate manner and for an appropriate period, commensurate with the nature and size of the food business. Food business operators are to make relevant information contained in these records available to the competent authority and receiving food business operators on request.

9. Food business operators producing or harvesting plant products are, in particular, to keep records on: (c) the results of any relevant analyses carried out on samples taken from plants or other samples that have importance to human health.

4.2 Substrate for propagation

Some businesses may produce seedlings in peat or coir plugs before placing them into the beds to grow. This substrate can be a potential source of microbial contamination by human pathogens. Peat particularly can have variable levels of *E. coli* present.

How to comply with the law

Each batch of material must be verified as free from pathogens

Best Practice

- A record of a microbiological analysis from the substrate producer should be available for each batch of material or a Certificate of Compliance should be provided by the supplier.

5 Appendix

Legislation

Regulation (EC) 178/2002 requires that all food placed on the market must be safe to eat and defines requirements for traceability.

<http://www.food.gov.uk/multimedia/pdfs/1782002ecregulation.pdf>

Reg. 852/2004 on the hygiene of foodstuffs and particularly Annex I – Primary Production, Part A: General hygiene provisions for primary production and associated operations.

[http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0852R\(01\)&from=en](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004R0852R(01)&from=en)

Reg.1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:300:0001:0033:EN:PDF>

General guidance

Guidance on the general approach to microbial food safety in fresh produce

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/microbial.pdf>

Guidance for Enforcement Authorities on the Use of Private Water Supplies in Primary Production in relation to Regulation (EC) No 852/2004

<https://www.food.gov.uk/sites/default/files/private-water-supply-guidance.pdf>

Staff training guidance and videos

<https://www.food.gov.uk/business-industry/food-hygiene/training>

Guidance Notes for Food Business Operators on Food Safety, Traceability, Product Withdrawal and Recall

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/fsa1782002guidance.pdf>

Managing Farm Manures for Food Safety - Guidelines for growers to reduce the risks of microbiological contamination of ready-to-eat crops

<https://www.food.gov.uk/sites/default/files/multimedia/pdfs/manuresguidance.pdf>