

APPLICATION FOR REGISTRATION OF A TSG
COUNCIL REGULATION (EC) No 509/2006 on agricultural products and foodstuffs as
traditional specialities guaranteed
"Watercress"
EC No:

1. NAME AND ADDRESS OF THE APPLICANT GROUP

NFU Watercress Association
c/o Vitacress Salads Limited
Lower Link Farm
St Mary Bourne
Nr Andover, Hants
SP11 6DB
Email: sdr@vitacress.co.uk
Tel: 01264 732009
Fax: 01264 738960

2. MEMBER STATE OR THIRD COUNTRY

United Kingdom

3. PRODUCT SPECIFICATION

3.1. Name to be registered (Article 2 of Commission Regulation 1216/2007)
"Watercress"

3.2. Whether the name is

- Specific in itself
 Expresses the specific character of the agricultural product or foodstuff

3.3. Whether reservation of the name is sought under Article 13(2) of Regulation 509/2006

- Registration with reservation of the name
 Registration, without reservation of the name

3.4. Type of product [as in Annex II]

Group 1.6: Fruit, vegetables and cereals, fresh or processed

3.5. Description of the agricultural product or foodstuff to which the name under point 3.1. applies (Article 3(1) of Commission Regulation 1216//2007)

Watercress denotes the product obtained from *Nasturtium officinale*, which in the mid 1970s was reclassified as *Rorippa nasturtium – aquaticum* to better reflect the aquatic nature of the plant.

Watercress in the UK was historically referred to as Water-Cress to reflect the fact it was a cress cut from flowing water courses (Gerard's Herbarry, 1597 and Culpeper's Herbarry, 1653). Since the late 1800s Water-Cress has become commonly referred to as Watercress.

Traditionally grown watercress is cut from flowing water, and is characterised by soft mid-green, moist leaves which have an unbroken edge and an oval shape. The stems are crisp, slightly paler in colour and can have some lateral roots extending from the joints of leaves to the stem.

Characteristically watercress has a mustard after taste. It is peppery, hot and slightly bitter. The plant is grown in pure flowing water of high microbiological quality. Watercress is a plant that has been unaltered by selection and breeding in terms of morphology and flavour and today it looks identical to illustrations of the plant dating to Greek and Roman times.

Watercress is cut for sale when it is 10 to 15cm long and sold bunched and or washed in packs. The bunched product is characterised by pale stems stripped of leaf and root for 5 or 6 cm and held together by a rubber band above which dark green leaves form the "head" of the bunch. The more popular washed packs are of separate stems of watercress, generally less mature than in the bunch, with smaller leaves, arranged in a random manner to form a tangle of stems, petioles and leaves

3.6 Description of the production method to which the name under point (3.1.) applies (Article 3 (2) of Commission Regulation 1216//2007)

Watercress grows all year round in UK watercress beds, protected from winter frosts and excess summer heat by the flowing spring water that leaves the ground at a constant 10°C to 11°C. In the summer the crop grows quickly, within 4 weeks if planted as seedlings onto a bed or within as little as 3 weeks as a returning stubble crop regenerated from the cut stems and roots remaining after harvest. In winter the crop continues to grow, but at a slow rate given cold, short days.

Watercress bed design

Traditional watercress beds vary but are characterised by an impermeable base, generally of compacted chalk, flint and gravel covered with a dressing of 10mm gravel and inclined at a gradient of about 1cm in 300cm. The beds are bound by impermeable walls that entrap the flowing water, channelling it from top to bottom, through the crop. A typical UK bed would be 10m wide and up to 100m in length, but various designs and sizes can be employed so long as they provide for pure water to be flowed through the watercress crop.

Cropping beds are constructed to prevent the ingress of contaminated water and are protected from contamination by animals. This is done by fencing sites and ensuring the land close to the beds is well drained, or separated from them by impermeable walls.

Water supply

Water for a traditional watercress farm is either pumped from bore holes drilled into the underlying aquifer or rises by natural, artesian, pressure as springs. The Environment Agency (EA) licence this abstraction. It is deemed by the EA as "non consumptive" because the water is passed through the crop then returned to support the flow of rivers. The licences are issued on an "in perpetuity" basis requiring the EA to compensate a grower of watercress if his licence is reduced or curtailed at any time.

Water is introduced to the top of a bed at a rate suited to the crop growth stage. In some beds the water is delivered in pipes and the amount going into the bed controlled by a

valve. In others the water pumped or drawn from springs passes the top of the beds in concrete channels into which hatchways are set. A board is used to dam the hatchway and by gradually raising the board more water is allowed to flow from the channel into the bed.

Flow is initially kept low to allow recently planted crops to root onto the gravel, and then progressively increased after daily inspection by the watercress grower to meet the crop's nutrient needs. In frosty weather high flows are used to keep the crop from freezing.

Watercress Bed Planting

Watercress growers raise their own seed by allowing the crop to flower and set seed in the summer. Some seed is grown and sold commercially in France.

Watercress seed can be hand or machine spread onto watercress beds and left to grow until ready to harvest. This takes between 8 to 10 weeks in summer. Equally the seed can be applied to compost in protective tunnels or glasshouses, near to watercress beds, equipped with overhead irrigation, and grown to 3cm to 5cm as dense mats of seedlings with densities of 20 to 30,000 stems per metre squared (m sq). This takes between 12 to 14 days.

The seedlings are then planted to cropping beds at more or less 1:10 ratio. (i.e. 1 m sq of seedlings is spread to cover about 10m sq of cropping bed at a density in a range of 2,000 to 3,000 stems per m sq). Planting simply involves spreading the seedlings evenly over the gravel bed. Within days they root onto the gravel and thus anchored can take ever increased water flows which provides the nutrients (and in winter months the warmth) for growth.

Watercress Growing

Seedling planted beds grow into crops that are ready to harvest in +/- 4 weeks in summer. In winter seedling crops can take 4 months to come to harvest.

Fertiliser is added to the bed base and, at times of rapid growth, to the flowing water to supplement the water's natural nutritional content. These are mainly slow release, phosphate compound fertilisers, such as furnace poultry (chicken and turkey) manure. Rock phosphate, a mineral dug from the earth that is rich in phosphates but slow to dissolve can also be used. These are added as granules or pellets to the beds just before or after planting. At times of rapid growth, growers will "top dress" the watercress crop with liquid fertiliser; a soluble agricultural compound. Growers consistently monitor the concentrations of fertiliser flowing through their beds

Fertilisers are not used in the winter as crops grow slowly and the water has all the minerals required. With a slower crop growth in the winter the yield is lower than in the summer.

Bunch Harvesting

The crop is cut in an orientated manner, "head-up" generally by hand with a knife and laid in plastic crates that hold up to 10Kg of watercress. It is quickly transported to pack houses where it is chilled to under 5°C and bunched into no less than 100g bunches.

Loose Watercress Harvesting

When harvested for prepared salad the crop is cut by machines and put in plastic crates. Cut in this way the stems are not aligned and are arranged randomly. They are chilled to less than 5°C, and then washed by submerging in tanks of flowing water.

Packing and Distribution

The watercress is boxed into waxed cardboard or plastic crates that hold between 10 and 20 bunches. Crushed ice is often sprinkled over the bunches before the lids are sealed to maintain freshness and moisture.

Loose watercress is spun to shake off excess wash water and packed into retail bags using automated bagging lines which pre-weigh the watercress and drop it into continually formed plastic bags. They are transported to the supermarkets or stores in refrigerated lorries.

The assigned “use-by” or shelf life is generally less than 7 days from packing.

3.7 Specificity of the agricultural product or foodstuff (Article 3(3) of Commission Regulation 1216//2007)

Traditionally grown watercress is cut from pure flowing water, and is characterised by soft mid green, moist leaves of an oval shape. The stems are crisp and it can have some lateral roots extending from the joints of leaves to the stem. The plants have a characteristic mustard after taste; peppery, hot, slightly bitter.

Grown and harvested from pure flowing water is what gives watercress its unique quality. It is a method of production that has remained essentially unchanged since it was first established in England in 1808 although the method of growing watercress in flowing water dates back to Roman times.

The peppery taste characteristic of watercress is due to the mustard oils inherent in the plant. This oil is known as Phenylethylisothiocyanate or PEITC. PEITC has been linked to cancer prevention and is helping watercress gain prominence as a super food, with strong anti cancer properties attributed to its mustard oils. Published studies show that animals fed PEITC as a supplement are more resistant to carcinogenic poisons and die more slowly from induced cancers. The UK Watercress growers have funded research at the University of Ulster and University of Southampton to show that eating watercress helps prevent cancer. See www.watercress.co.uk (sub section Health Professionals).

Stress affects the levels of PEITC in the plant. If watercress is stressed through low or high temperature, or subject to water shortage the plant produces variant levels of PEITC.

In order to have relatively uniform and consistent levels of PEITC (and therefore relatively uniform flavour and health giving properties) the crop needs stable, stress free growing conditions in terms of temperature, water supply and fertiliser. Having a water based cultivation where constant flowing water is supplied throughout the life cycle of the

plant is the ideal way to maintain temperature; the flowing water cooling the crop on hot days and warming it on cold days.

By comparison a soil grown crop does not have controlled temperatures. Soil and leaf temperatures can reach 40°C on a hot sunny day in the UK and in frosty weather the leaves can suffer freezing damage. These variable levels of stress will result in an irregular PEITC production by the plant, meaning a variable flavour and health benefit delivery.

To be traditionally grown, watercress must be grown in pure flowing water. Soil grown cress which has entered the market over the last few years is grown under plastic or glass in the same way lettuce or any other salad can be grown. Though the method of production is entirely different from water grown watercress, soil grown cress is called watercress because it looks the same and can be passed off as water grown watercress. But it has not been produced in the same, time honoured manner. It is not a traditionally produced speciality product, but simply one of many conventionally farmed leafy salads.

We have subjected samples of land grown watercress to comparative testing against traditionally grown watercress. The first test was conducted by Wirral Sensory Services in October 2008 The assessment was conducted by 100 consumers, all regular purchasers of prepared salad products, with a cross section of age groups and socio-demographics. The respondents were given a sample of each product to taste and were asked to score them on a 10-point hedonic scale for a number of key parameters. The products were de-branded and were presented according to a statistical design to avoid any potential bias. The respondents were asked to pay special attention to the pepperiness of the watercress by also scoring them on a five point diagnostic scale.

The results are shown under the headings Hedonic Results and Diagnostic results below:

Hedonic Results

RESULTS (Mean score where 1 = Extremely Unacceptable, 10 = Extremely Acceptable)

Scores out of 10	Soil Grown	Water Grown
Colour	7.89	8.03
Size of sprigs	7.54	7.72
Pepperiness	6.12	6.55
Texture	7.29	7.41

Diagnostic Result

RESULTS (Mean score between 1 and 5 where 3 = Just Right)

Pepperiness	Soil Grown	Water Grown
1 = Nowhere near peppery enough 5 = Far too peppery	2.50	3.13

A further sensory evaluation was conducted in June 2009 by Campden Food Research Association.

This was a triangle test, aimed at establishing difference between 2 samples, where both types of watercress, land and water grown were presented, one in duplicate, to a panel of 24 trained assessors asked to identify differences.

20 of 24 trained assessors identified the land cress as different. The criterion most mentioned by the assessors was flavour. Comments were made as to land grown watercress having less flavour; weaker flavour; less peppery flavour. Some comments were also recorded as to the water grown sample having darker leaves.

These two assessments demonstrated that on both occasions a professionally conducted evaluation of land versus watercress identified differences, and when preference was sought, identified watercress as superior – on organoleptic qualities alone.

3.8 Traditional character of the agricultural product or foodstuff (Article 3 (4) of Commission Regulation 1216//2007)

The traditional character of watercress is enshrined in its production method. It has been associated with flowing water for thousands of years. Traditional watercress has to be grown in flowing water. The water must be of a quality appropriate to the production of a minimally processed food, which means one that can be consumed without cooking.

Historically watercress has always been associated with aquatic production. Hippocrates, the founder of modern medicine is recorded to have chosen the site for the world's first hospital, on the island of Kos, close to a stream suitable for cultivating watercress which he regarded as essential to the treatment of his patients.

In the UK the first commercial production of watercress in beds is attributed to William Bradbury in Kent, 1808. Prior to this date watercress was gathered from the banks of the Thames and its tributaries for centuries to supply the London markets.

As the railways developed through the 1800s so too did watercress cultivation, using rail links back to the London markets to facilitate production in pure spring waters typically found in the chalk valleys, of Hampshire and Dorset – where the core of the UK watercress industry remains today.

Traditionally, pure spring waters rising from chalk contained all the minerals needed for watercress growth other than phosphorus. This was fortuitously available as a slow release phosphate fertiliser in the form of basic slag, a by-product of the traditional steel making process. This by-product was a grey / black powder formed from the spent coke and iron ore remaining after smelting. For almost 200 years watercress was grown using pure spring waters supplemented by bed base applications of basic slag which supplied the phosphate fertiliser and trace elements the crop could not find in the flowing water. Today the steel making process has changed and basic slag is no longer available. Consequently, slow release phosphate rich compound ash is now used instead.

By the late 1800s watercress was a significant source of employment and revenue. In Alresford, Hampshire alone the train would carry upwards of 30 ton a week of watercress to the London markets. The restored steam railway is still known as “The Watercress Line” today.

By the 1940s there were some 400 hectares (Ha) of watercress bed in the United Kingdom.

By the 1970s the industry was in decline as a result of a fungal root disease in the 1950s and cuts to rural rail services in the 1960s which removed the route to market for many outlying farms that lacked the critical mass to justify lorry transport.

In the UK today there remains 70Ha of productive watercress beds centred in Hampshire and Dorset. The remaining growers are however highly active in marketing. Some £800,000 has been spent in the past 5 years to promote water grown watercress, including direct funded anti-cancer research. All PR activity and advertising stresses the crop’s unique cultivation in pure flowing water. Reference to same is made on most packaging. This reinforces the traditional expectation of the UK consumer that watercress is grown in pure flowing water.

3.9 Minimum requirements and procedures to check the specific character (Article 4 of Commission Regulation 1216//2007)

Watercress must, for the majority of its growth cycle, be grown in, and be harvested from, purpose constructed beds irrigated by flowing water of a purity fit for the production of a “minimally processed food”. (i.e. a food that is not processed so as to eliminate microbiological or chemical contamination before it is offered for consumption)

Specifically the inspection must establish:

The Water Source

1. The water source is suitable and unpolluted
2. The water must be of high microbiological quality suitable for production of a minimally processed food crop.
3. Sources must be secure from contamination, and tested for enteric coliforms and E. coli monthly until a consistent and acceptable trend is established, whereupon a reduced testing rate is acceptable, up to annually.

The Growing Beds and Surrounding Areas

1. Watercress production is in beds of suitable construction which are protected from pollution, both from polluted water runoff/seepage and from livestock/other animals
2. The Growing Beds must be bounded at the top and sides by impermeable walls that enclose the flowing water, channeling it through the crop.
3. Be constructed to prevent the ingress of contaminated water
4. Be protected from contamination by animals.

4. AUTHORITIES OR BODIES VERIFYING COMPLIANCE WITH THE PRODUCT SPECIFICATION

4.1. Name and address

Name: Stacey Walker,
Crop Schemes Supervisor
NSF-CMI Certification Limited–
Address: Long Hanborough
Oxon–OX29 8SJ
Telephone: 01993 885610
Fax: 01993 885611
Email address:

[Select one, “X”:] Public Private

4.2. Specific tasks of the authority or body

The inspection body must establish the source of product sold as watercress by inspecting production facilities with the object of establishing that all watercress sold from the site has, for the majority of its growth cycle, been grown in, and been harvested from, purpose constructed beds irrigated by flowing water of a purity fit for the production of a “minimally processed food”. (I.e. a food that is not processed so as to eliminate microbiological or chemical contamination before it is offered for consumption).