

**SUMMARY**  
**COUNCIL REGULATION (EC) No 510/2006**  
**APPLICATION TO REGISTER:**  
**YORKSHIRE FORCED RHUBARB**

**PDO (✓) PGI ( )**  
**National File No: PDO/**

**1. Responsible department in the Member State: United Kingdom**

Department for Environment, Food and Rural Affairs  
(DEFRA)

Food Chain, Marketing and Competitiveness Division

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**2. Applicant Group**

**a) Name:** The Yorkshire Rhubarb Triangle Growers

**b) Address:** Hopefield Farm

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**c) Composition:** producers/processors (12 ) other (None)

The Yorkshire Rhubarb Triangle Growers are a non legal association.

**3. Type of Product:** Fruit, vegetables and cereals fresh/processed -  
Class 1.6

**4. Specification (summary of requirements under Article 4 (2))**

**a) Name:** Yorkshire Forced Rhubarb

**b) Description:** The tall slender sticks of the rhubarb, known as petiole sticks, range pink to red in colour with a compact yellow leaf (the leaves are usually removed for supermarkets). The intense colour, which varies from salmon pink to blood red, is dependant upon variety; rate of growth, temperature used and water take up. They have a white butt at the base where the stalks were attached to the root system. The inside of the stalks are white and fleshy. The taste is sharp, and slightly acidic, with a delicate flavour. The microbiological, chemical qualities of the indoor rhubarb contain oxalic acid, calcium in the form of calcium oxalate, potassium, and plant oestrogen. Yorkshire Forced rhubarb's colour is enhanced by the technical process and absence of light resulting in a gossamer skin with a white inside flesh. When cooked, Yorkshire Forced rhubarb is very tender, and the flavour is more delicate and less acidic than its counterparts, due to differing production techniques and traditional local organic feeds including shoddy, which is specific to the area.

Unlike other producers The Yorkshire Forced Growers do not allow light to inter- act with the plant whilst in the forcing sheds as photosynthesis will occur which thickens and toughens fibres and results in a more acidic flavour.

The growers harvest by candlelight wherever possible to minimise this risk, Forcing too quickly also results in loss of flavour, so 6-9 weeks steadier growth to first harvest is preferred, in the Triangle.

The Forcing Varieties that are currently used in the Triangle are:

Timerley Early

Stockbridge Harbinger

Reeds Early Superb / Fenton's Special (Regarded as the same)

Prince Albert

Stockbridge Arrow

Queen Victoria

This list is not exhaustive and other varieties may be used in the future.

### **c) Geographical Area**

The geographical area of production connects the boundaries of Leeds, Wakefield and Bradford and is nestled at the side of the Pennines. The area forms a triangular shape and has been historically termed as 'The Rhubarb Triangle'. The exact geographical area goes from Ackworth Moor Top north along the A628 to Featherstone and Pontefract. Then on to the A656 through Castleford. It then goes west along the A63 past Garforth and West Garforth. Head north passing Whitkirk, Manston and on towards the A6120 by Scholes. Follow the A6120 west, round to pass Farsley which then leads south west via the A647 onto the A6177. Pass Dudley Hill to pick up the M606 south. At junction 26 take the M62 South to junction 25 head east along A644 toward Dewsbury, passing Mirfield, to pick up the A638 towards Wakefield. At Wakefield take the A638 south to Ackworth Moor top.

### **d) Proof of Origin**

#### **Root Stock**

New forcing roots are obtained from propagating or splitting from our own reserves, the resulting new plants are called 'rhubarb sets' Root stock has been handed down within families for generations or purchased from other growers. In later years as new modern varieties were bred the stock was initially purchased from Nuclear stock Association (not now available). The only way to get new stock is from roots that have been split from a parent

plant, as growing rhubarb from seed although possible, cannot give a guaranteed pure untainted strain due to cross pollination. Only by splitting the roots from current stock can the purity of strain be ensured but requires significant experience to select out deviations from strains or diseased plants. The root stock itself is split into the respective varieties which are kept in separate fields. All of the roots are traceable back to individual fields. This information is recorded in field records which keep track of where roots come from and where they are planted forward.

### **Forced rhubarb Traceability**

Roots purchased outside the Rhubarb Triangle must have been grown within the Triangle for a minimum 2-3 preparative year prior to forcing, so that the root has the benefit of the specific soil and climatic conditions so beneficial to root development. Also having been in direct control of the Triangle forced rhubarb producer.

### **Filling the sheds with roots prior to forcing**

The roots are taken from the field, and are loaded carefully by hand onto trailers for shipment from field to forcing shed, each driver recording his loads and field of source that the roots have come from that day. Each of the respective forcing sheds is numbered so this number is placed on the day sheet for that day.

For the husbandry aspect each shed has a log which shows when the shed was filled and when the heat was turned on. The sheet also has the times and dates of any watering which takes place.

A Log sheet is kept recording the harvesting of each shed. The log shows the date and the amounts received into the grading area from each shed. These amounts are logged in terms of class 1, class 2 and waste which are graded according to UNECE STANDARD FFV-40. Each pallet of graded product is then labelled as to which shed the product came from and the date which the product was pulled.

The pallets are then taken to the packhouse where the rhubarb is de-leafed and placed into the cold store with a Quality Control (QC) identification reference. A Q.C sheet with corresponding reference is completed accessing and recording the raw material quality. Raw product is assessed against criteria set by the product purchasers; supermarkets and other retailers.

Forced rhubarb for shipment to wholesale markets is graded out as above, but the leaf is left on. It is then packed in a cardboard box, which is lidded and the appropriate grade and variety printed on it.

Forced rhubarb for supermarket use is then packed according to customer specifications with a corresponding Q.C. sheet available for each consignment. Supermarket produce bag labels are specific to the customer and are generic to forced and outdoor rhubarb the label states British Rhubarb and are printed with the producer's/grower's name and packing code, variety, - Grown in Yorkshire UK and Weight. The date is computer set as to the shelf life of the product, which is directed by individual customer specifications. The bags of rhubarb are put into the customers specific trays. Tray end labels state Variety grower code and - Yorks UK. The total number of trays ordered that day is then divided out into that customers respective named depots for delivery to that appropriate part of the country.

The delivery notes are printed ready for dispatch.

Before the product is loaded a quality control is carried out again. This shows and records the final quality of the product as it leaves the packhouse. This includes a copy of the labels to ensure traceability, and the batch number of the plastic which the product is packed in.

The product release form is then signed by the packhouse manager and the driver of the customers transport.

This process completes full traceability of the product from "field to fork".

## e) Method of Production

### Soil preparation:

Large amounts of farmyard manure and shoddy (waste shards from the wool industry, rich in nitrogen) are spread onto the land in autumn or pre-planting to 'feed' and lighten the usually heavy, cold water retaining soils of the area. The local wool industry provides the rhubarb producers with *shoddy*, a waste by-product to the wool industry, but a valuable high nitrogen feed, cheap and readily available to the rhubarb industry. The nitrogen it supplies is released slowly over a three year period. Although in the past the fields would have been extensively covered with as much shoddy that each farmer could purchase, shoddy is now spread according to nitrogen sensitive zone guidelines. Soil samples are taken and the shoddy is analysed and then spread accordingly, prior to planting.

### Root propagation and planting:

Rhubarb 'sets' or root sections are planted out whilst the plant is in its dormant period between October – March in Yorkshire.

The soil is removed from a 2 year old stock root (plants used only for propagation purposes not for harvesting petioles) to allow close inspection of the parent plant for any signs of crown rot, disease or deviations from the true strain.

It takes years of experience to correctly identify roots which must not be propagated forward and must be rejected out. Each farm will have developed their own traditional skilled methods in preparing the roots for propagators. A sound parent plant is sectioned by the skilled propagators using the specially made cutting tool. The new plant or 'set' will have sufficient body or woody root to support 2 – 3 buds at the top of the root. Sectioning too small will result in a weaker root, and greater losses in the newly planted field. Inexperience causes decreases in stock instead of increase - the parent plant could also simply fall apart as useless broken

cuttings if incorrectly cut. A team of fully skilled propagators is essential to ensure strong healthy pure strains remain on farm. Strict crop rotation should be implemented with rhubarb as any other crop to prevent disease and virus infiltrating stock, roots.

The resulting sets are planted using the farms individually designed and built planting machine. Each set is examined prior to inserting into the furrow and being covered with soil.

### 2-3 year outdoor stage:

Over this period an energy store is built up in the root system supplementing the organic fertiliser by top dressing with nitrogen. The plants high demands for feed must be met. The initial petiole stalks, emerge, photosynthesis occurs (using light energy interacting with chlorophyll), which results in the formation of  $C_6H_{12}O_6$  (glucose) usually used by plants for growth, but here helps to build up the crucial energy store, as energy is not required for crop production, all energy given to or made by the plant can be stored within the root as carbohydrate.

Large main buds develop on the crown or growing surface of the root ,as harvesting outdoor crop from a forcing root not only causes the formation of much smaller bud systems which simply cannot produce large amounts of class one product, but energy would be used for crop production and not stored . Harvesting outdoor rhubarb from a root intended for forced production would result in severely reduced yields in the forcing sheds and thin petioles at harvest the root size increases dramatically over this 2 year preparatory stage. A two year old forcing root can weigh up to 50kgs requiring 2 men to lift it. A root is regarded as being at its best for forcing at 2 year old in the Triangle, which cannot be achieved elsewhere in such a short time taking anything from 4-6 years elsewhere. This can only be indicative of the highly favourable conditions for root formation found specifically in this area.

Originally found on the banks of the river Volga in southern Siberia this plant demands cool wet conditions. Water retaining soils are also very important for the optimum growth of the root during the summers and specifically autumn and early winter prior to forcing, so cold can permeate the soil and be held there for the next crucial stage.

#### Dormant period:

The rhubarb triangle is situated in the shadows of the Pennines. The Pennines contribute to the perfect conditions necessary for forced rhubarb production, being cold and damp. Cold heavy water retaining Yorkshire soils are necessary to keep the temperature low. Extended low autumn and early spring temperatures help prolong the dormant period. Long growing periods outdoors are detrimental to both energy store production in the root, and in the resultant petiole quality. The soil is a medium loam to heavy clay slightly acidic with a 6 to 6.5 ph. A deep top soil often is covering a much lower sandstone sub soil which allows free drainage of any excess moisture capable of causing 'crown rot'

#### Cold unit collection:

Cold temperature is recorded as 'cold units'. Different varieties require different cold levels, essential to the plant, before growth can be induced in a forcing shed. Frost converts the plants' energy store (carbohydrate) into glucose, thus freeing the energy necessary for growth when light and therefore photosynthesis is prevented in the forcing sheds. Without frost, stored energy is not converted. High yields and high percentage class one sticks cannot be achieved.

Soil temperatures are taken daily from thermometers inserted where roots are growing outdoors. Cold units are calculated and a total accumulated, specific to each variety, thus total energy will be accessible for growth. Daytime - rise and evening – fall in temperature whilst the plant is in the ground gives a natural complete conversion

Other producers of forced rhubarb do not use this natural method, whilst in the soil, instead artificially chilling the roots in cold stores or applying



Gibberellic acid. The adverse effect to crop quality when using Gibberellic acid is that the resultant petiole is thinner and much paler.

#### Root lifting:

Great care and skill is required to remove the root from the ground without damaging the growing buds or crowns from which the petiole sticks will emerge. Losing this point of growth (the crown) altogether will result in no crop. Loosing sections of the root itself, with its reserves of growth energy will result in a poorer quality stick and reduced yields. Techniques of carefully lifting roots at this crucial time have been traditionally passed down within families through generations. Historically ploughed out by horses, later some families designed and built their own lifters to open the soil and lift the roots onto the soil surface. These machines must be extremely robust, capable of lifting the very heavy roots and the soil they hold. All work is then done by hand to protect the bud systems from damage. Machinery always proved too damaging. Shipment from field to shed is a long labour intensive process with extreme caution required, preventing damage to the delicate buds. Specially designed forks with three short thick prongs prevent damage and are capable of bearing the weight of the roots.

#### Bed formation:

In the shed skilled men with years of experience swing and matt the roots together to form a growing bed of system roots without causing damage to the delicate bud area or crown, yet maximising the shed floor capacity, discarding any roots considered unfit for the forcing procedure.

The root crowns are then washed clean of soil prior to applying heat to the darkened shed. No light is allowed to interact with the plant at any stage.

Botrytis is a plant disease favouring warm damp conditions. Damage to the crown of the root allows infiltration of the fungal spores. Careful handling of the root systems is therefore essential; mechanisation has always proved too damaging to the roots. After lifting from the ground all work is done by hand and roots are transported from field to shed in single layers on trailers, not stacked as it is too damaging.

Botrytis will result in an earthy taint to the petioles in its slightest form, to severe rot at its worst, starting at the leaf and working down the petiole shaft. Incorrect watering or heat at certain stages will also result in botrytis.

Holland's forced rhubarb producers grow the roots on flat beds as apposed to the ridged beds in Yorkshire which protect the plant from high temperatures and help conserve the cold in the soil in winter also allowing excess water to drain away from the crown or growing point of the root.

We use specially designed splitting tools similar to a lawn edger, with a much shorter shaft and a thick robust blade. This allows the propagator to cut precisely using his full body weight to cut through the large structured roots. Knives are used in Holland and these simply cannot cut through the large body of a Yorkshire root.

The Dutch lift the roots onto the soil surface as their generally sandy soils are not water retaining and therefore unable to hold the cold naturally as in the Yorkshire Triangle they are then stacked into bulk bins to accumulate artificial cold units in a cold store. This method does not allow all roots to chill correctly when insulated by the mass of roots within each bin, nor does it allow for the natural rise and fall of daytime and night time temperatures which gives a natural total conversion. Root crowns are susceptible to damage piling in bins. Gibberellic acid is then applied to the root to compensate for the short fall in cold units which results in paler thinner petioles.

In Yorkshire forced rhubarb is grown in specially built traditional rhubarb sheds, which are now insulated, but in Holland they simply black out greenhouses. Harvesting in Holland is done by electric light, allowing photosynthesis to occur. The whole point of forcing is to prevent this process as it results in a more fibrous petiole with a sharper acid flavour.

In a Yorkshire forcing shed there is a central access path with side branching harvesting paths to beds which are 2 arms length wide allowing access to the beds from both sides. In Holland they simply walk over the roots to harvest the petioles which would be impossible in Yorkshire as the resultant crops are so fecund and prolific there is no space between the petioles to place a foot. This is indicative of the strength of the root, and ultimately its wellbeing.

#### Heat application:

Initially cheap local supplies of out graded coal and coke from the Yorkshire coalfields were used. Today, heat is applied, either by warm blown air, fuelled by propane or, diesel fuel burners or by heated water pipes. Temperatures vary at different stages of the process and between different varieties. Currently we are looking at more renewable forms of energy as prices escalate to uneconomical levels.

#### **f) Link**

Nestled at the side of the Pennines the Rhubarb triangle has the advantage of geographical and environmental factors specific to this area, which are the main influencing factors necessary to the formation of a strong forcing root. High rainfall and early and extended dormant periods in root growth is necessary for early breaking of dormancy without loss of quality or yield. The soil must be carefully prepared to a depth great enough to allow the extensive roots to grow. Good moisture levels are important, but too much can cause the root to rot. Moisture retaining soils are beneficial for two reasons: firstly at plant establishment to aid growth and secondly to retain low temperature levels necessary both for the natural requirement of the plant and stored energy conversion. This is crucial for the quality of a forced petiole. Insufficient dormant period while the root lives outside in preparation for its forcing purpose, results in low yields, poor quality and flavour and returns not covering production costs.

The Yorkshire soil is capable of producing a superior root and thereby superior petiole stick of extremely high quality, from the huge root systems with large main buds. Water is applied directly from the mains throughout the indoor growing period. The varieties grown and bred specifically for and by soils in this geographic location provide, with the help of all the contributing factors, the outstanding quality, flavour and colour that is traditionally grown Yorkshire Forced Rhubarb. The soil and climate in the area are perfect for growth of the substantial root systems necessary for this out of season use.

The Yorkshire producers were centralised on the suitable soils between Leeds, Wakefield and Bradford, which became known as 'The Rhubarb Triangle'. The position of the Rhubarb Triangle situated within the shadows of the Pennines acts as a frost pocket. This geographical location has proved invaluable to the growers, as it provides the perfect weather conditions essential to the plant.

Heavy industry in the area resulted in an atmosphere that helped induce early die back in autumn. Soot and ash were extensively spread onto the soil obtained from local industry, and the high local population's chimneys resulting in sulphur deposits in the soil much to rhubarb's liking.

From an accidental discovery in Chelsea London in 1817, the early basic technique of growing rhubarb out of season began, initially by warming the root by covering with organic manure whilst still in the ground. In 1877 it came to Yorkshire. This was the first place in the world that special sheds were built for the purpose of forcing, and the technique as still used today was devised by the local Yorkshire growers. The soil in the area proved perfect for growth of the substantial root systems necessary to produce sufficient yields to cover the high costs of production. In the late 1800s rhubarb's popularity grew so high there were over 200 dedicated producers alone in the Triangle.

As the producers in Yorkshire consistently had the crop ready much earlier than elsewhere in the country, eventually growers in other parts of the country ceased production all together as they could not compete with the Yorkshire producers who had such beneficial conditions, and developed growing skills which ultimately resulted in the petioles that the Yorkshire Forced rhubarb growers became renowned for. The remaining growers could be found in Leeds, Wakefield and Bradford, which has become known as “The Rhubarb Triangle”.

This name Yorkshire Forced Rhubarb has been used by producers generally when marketing the product onto wholesale markets since 1877. At that time this was the usual outlet for the fresh product throughout the country. Point of retail also used this term which was also in general public use since, and is used as a term of specific reference on many web sites ([www.herbsphere.com/rhubarb.htm](http://www.herbsphere.com/rhubarb.htm)) including our own [www.yorkshirerhubarb.co.uk](http://www.yorkshirerhubarb.co.uk).

**5) Inspection body**

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**6) Labelling**

There are no specific restrictions concerning packaging. Existing food labelling regulations and retailers’ requirements are taken into account. The name “Yorkshire Forced Rhubarb” is used.

**7) National requirements:**

