

## SPECIFICATION

### COUNCIL REGULATION (EC) No 510/2006 on protected geographical indications and protected designations of origin

“East Kent Goldings”

EC No:

PDO (✓) PGI ( )

#### 1 RESPONSIBLE DEPARTMENT IN THE MEMBER STATE: UNITED KINGDOM

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#### 2 GROUP

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**Composition:** Producer (6) Other ( )

### 3 TYPE OF PRODUCT

Class: 1.8 - other products of Annex 1

### 4 SPECIFICATION

(summary of requirements under Article 4(2) of Regulation (EC) No 510/2006)

#### 4.1 Name:

“East Kent Goldings”

#### 4.2 Description:

East Kent Goldings is the name given to a unique variety of hops which are used in brewing the finest ales and beers. Cones form on the female plant of “*Humulus Lupulus*” – also known as the “wolf of the woods”, the cone is made up of soft tissue “petals” on the inside of which are the lupulin glands. These contain a sticky oily substance, – lupulin, which provides essential oils and resins. The cones are used primarily for brewing. They offer delicate floral aromas of lightly sweet lemon.

The shape of the cone is long and oval measuring between 1.25cms and 2.5cms. The cone is rich green in colour with an inner surface of thin pale petals dusted with bright yellow lupulin which surrounds the base of the seed. The texture of the cone is sticky and oily at harvest, but once dried for preservation, it becomes crumbling pale petals with distinct yellow lupulin glands. The aroma is a mixture of citrus, lemon and floral overtones. Dried East Kent Goldings, when added to the final beer, provide a flavour likened to rich marmalade.



These major oil components are constant between seasons and localities and, as described, serve to distinguish the Goldings from all other varieties. However, the minor oil components can fluctuate with environment and season and these compounds, many as yet uncharacterised, give the East Kent Golding its unique aroma and flavour.

#### **4.3 Geographical area:**

The geographical area of production is adjacent to the old Roman road now known as the A2 as far as Bishopsbourne. It starts with the parish of Rainham and passes through Hartlip, Tonge, Borden, Lynsted, Norton, Teynham, Buckland, Stone, Ospringe, Faversham, Boughton-under-Blean, Selling, Chartham, Chilham, Harbledown, Canterbury, Bekesbourne, Bridge and Bishopsbourne. From Canterbury the A257 extends the area through Littlebourne, Wingham, Staple, Ash and Woodnesborough.

#### **4.4 Proof of origin:**

Foundation stocks of the variety are maintained at Stockbridge Technology Centre, Yorkshire where they are inspected and certified true-to-type by FERA (Food and Environment Research Agency) plant health officials. Furthermore, growers receive plants of the variety from permanent layer beds derived from the foundation stocks. These layer beds are also inspected and certified true-to-type by FERA officials.

All production and preparation takes place in the designated area. The East Kent Goldings are grown, picked, dried and packed in the defined area and defined as "prepared". The bales or pockets that contain the dried hops are labelled and sealed with the growers name, variety, parish or region, year of harvest and EU number. The grower keeps a record of the field date of harvest and the bale or pocket numbers of the hops from that field. The standard of quality and identification complies with EU standards as described in EEC No. 1850/2006; the standards were originally set by The Hops Prevention of Frauds Act of 1875 and subsequently from 1932, The Hops Marketing Board. The bales of hops are bought by merchants or brewers for either immediate use or stored. The identity of the hops is taken through to the end user by the bale number.

The propagation and sale of all planting stocks of English hop varieties is regulated and documented through the Plant Health Propagation Scheme (European Plant

Protection Organization Bulletin 39 (2008) 278-283), known historically as the “A-plus Scheme”.

#### **4.5 Method of production:**

East Kent Goldings arises from a single seed. The resulting seedling develops into a mature plant which will differ from all other hop plants in terms of all its characteristics including morphology and chemical composition of its secondary products. A commercial variety is produced by clonal propagation from the unique original seedling plant by root division, runners (perennial shoots) or by softwood cuttings. Thus, every plant of a new variety is genetically identical to the original seedling because it has been produced by a-sexual means. Consequently, every plant can be used as the foundation stock for further propagation. See 4.4

The hop plant is a perennial root.

A variety of hop can be a chance seedling e.g. Fuggle and Whitbread Golding variety or, more often, a result of a plant breeder.

After the initial seed from the plant breeder which established the variety, the hop plants are propagated from strap cuttings or mist propagated green shoots. The original rootstock can produce hops for many years, if kept free from disease.

#### Preparation: (Winter Activity)

Ensure plants are vigorous. Ensure soil is fertilised and depleted nitrogen, phosphate, potassium and manganese are replaced. Ensure “wire work” – complex 5 metre tall framework of wires upon which hops will grow, are secured.

#### Stringing (February/March)

Loop strings (coir-twine) from ground to wire-work for hop-bine to climb and produce hop cones. “Stringing” was traditionally performed by stilt walkers and now by a worker from the ground with a long pole passing the string through a hook at the hop plant and to a hook on the top wire of the trellis.

#### Shooting, Training and Selection (March-April-May)

Shoots (“bines”) grow from underground root-stock early April. Shoots are trained around strings, selecting most vigorous at 2-3 bines/string. Surplus shoots are removed.

### Growth (June-August)

Daily inspection by growers and or staff as hops climb strings. Application of approved fungal sprays, approved by Chemical Regulation Directorate CRD (Pesticides), or equivalent, if infection noted. “Grubbing” – removal of wilted hop plants and sterilisation, isolation to prevent re-infection. Approved spraying against aphids and mite. Bines develop hops.

### Picking (September)

Optimum time for picking depends upon skilled judgement regarding the lupulin content which ranges between 3.5 – 7.5, with an average 4.7% alpha acid. The maturity is determined by a russet colour, by the shape of lupulin glands - which are full and bulge shaped - and the weather conditions. Sever bines at 4 feet high and at the top of the upper wire-work, are transported to picking sheds where hops are stripped from the bine and separated from leaf fragments. This element of production is labour intensive and weather dependent, requiring a fine judgement between balancing resources and yield against weather conditions. The cones are ready when they are 20% dry matter. An experienced grower can judge this by the colour and rustle of the cones, the colour and firmness of any seeds, and the brittleness of the central axis of the cone (the strig).

### Drying, Packing (September)

Reduce water content of hop from 80% to 10% without heat damage using hot air blowing through a hop bed. The hops are laid on hessian or plastic cloths over a slatted floor. The fan and heat source are situated below this floor in the plenum chamber. All living plant material contains water and this is dried out lowering moisture content of the hops from 80% to 10% to preserve them. Levelling of hops to prevent charring and burning off of lupulin. Pack into Hessian sacks –“Pockets” or bales.

### Storage, Distribution (October onwards)

Store naturally or in cold store at 4 ° ready for transport to brewer or process into hop pellets (compressed, vacuum packed for stability) or process into hop preparations/oils.

The Goldings are susceptible to several fungal pathogens including wilt disease (caused by *Verticillium albo-atrum*), powdery mildew (caused by *Sphaerotheca humuli*) and downy mildew (caused by *Pseudoperonospora humuli*). In addition they are susceptible to infestation by pests, notably hop aphid (*Phorodon humuli*) and two-spotted spider mite (*Tetranychus urticae*). Therefore, the Goldings require careful control of pests and diseases during cultivation including strict hygiene. The hops have full fungicide and insecticide spray programme for pest and disease control. Spray materials are approved by the Chemicals Regulation Directorate. *Verticillium albo-atrum* is transmitted by infected plant material spread by wind, vehicles or human feet. Strict isolation of hop gardens from casual visitors, foot dips of disinfectant and regular inspection of hop gardens, the removal of suspect plants and putting the area into grass are the methods used to keep the gardens clear of trouble.

#### **4.6 Link:**

The Goldings being grown currently in East Kent are derived from collections made by Wye College, Kent, in the 1890s and 1920s, and East Malling Research Station, Kent, in the 1940s. Both respected scientific institutions verified the origins of their collections. Furthermore, the morphology of the current variety exactly matches the descriptions given by growers, agronomists and scientists since the early 1800s. Modern analysis of the composition of the essential oils confirms that all the East Kent Goldings have a consistent chemical fingerprint. Thus, the current East Kent Goldings are undoubtedly the same variety as was selected by Mr Golding in the early 1790s as a clonal variant from the Canterbury Whitebine variety.

The Golding was selected from the old Canterbury Whitebine variety by Mr Golding at West Malling, Kent in about 1790 (Percival, R.A.S.E Journal for 1901). By the early 1800's the Golding hop was being grown in East Kent where the soils were "best adapted to their growth....deep rich soils on calcareous subsoils" (Rutley, R.A.S.E Journal for 1848). Grown in East Kent, it was considered to be superior to the hops grown near Maidstone, commanding a higher price. To distinguish the produce from this area, it was sold as East Kent produce ("The Hops Farmer", E.J Lance, 1838, London) thereby gaining the name East Kent Goldings. During the nineteenth century several local variants, or clones, were selected in East Kent including Bramling (1865), Rodmersham or Mercers (1880), Cobbs (1881), Petham (1885), Early Bird (1887) and Eastwell (1889).

Hops are an out-breeding, highly heterogeneous, dioecious species. Thus, the breeding structure of the hop species is very similar to humans with separate sexes producing progeny each one of which is a unique individual. Although there may be family resemblances, not two individuals are the same genetically. Similarly, it is impossible for hops to self-pollinate and, necessarily, each new individual arises as the result of the recombination of the genes of two distinct parents.

East Kent Goldings flavour characteristics are influenced by the soil of East Kent – brick earth over chalk giving an ideal pH of 6.5-7.00 and by situation – exposed to cold salt laden winds off the Thames Estuary – particularly in March when the seasonal and varietal hop characteristic are established. Research at the former Wye College has demonstrated that lower soil temperatures during February and March are strongly correlated with higher yields in hops (Department of Hop Research Annual Report for 1980, Wye College,) and that March temperatures can also be implicated in the bittering content of the resin in lupulin glands (Department of Hop Research Annual Report for 1982, Wye College). Furthermore, several of the precursors of compounds found in lupulin glands can be detected in bud and shoot tissues in March (Rossiter, Imperial College).

As shown in the table below, it is possible to distinguish Goldings from other unrelated hop varieties such as Fuggle (which has much higher farnesene) and Challenger (which has much higher selinene). Although the major oils pattern for East Kent Golding is similar to those of varieties related by pedigree, it is possible to distinguish it. For example, its seedling Northern Brewer has higher myrcene content and Northdown (a seedling of Northern Brewer) has higher farnesene content. There is also much variety-specific variation in the post-selinene minor peaks.

Typical composition of essential oil of hops in England (% content)

Variety	Myrcene	Caryophyllene	Farnesene	Humulene	Selinene
Goldings	25.2	11.2	0.5	36.2	2.7
Fuggle	29.4	10.2	7.5	30.8	2.5
Challenger	33.1	8.1	1.5	23.5	12.0
Northern	36.4	10.8	0.1	32.7	2.2

Brewer					
Northdown	23.5	13.7	1.3	39.4	3.1

The relative abundances of these compounds can be used to distinguish between hop varieties and research confirms that the East Kent Golding hop has a unique oil fingerprint

Although hops are grown world-wide, they always perform best in the localities where they originate. This was the conclusion of an extensive series of international trials of hop varieties from 1960 through to 1978 (Neve, (1983) J. Inst. Brew, 89, 98-101). The main reason for this was considered to be the influence of location on the date of flowering which was reflected in the yield obtained. This is confirmed by comparison of yields of East Kent Goldings in East Kent 2006-2009 with that in other areas.

East Kent Goldings	Hectares	Average Zentner/ha	Goldings	Hectares	Average Zentner/ha
2009	76.19	37.58	2009	198.69	26.76
2008	80.04	32.55	2008	199.95	25.92
2007	82.55	33.47	2007	192.37	26.69
2006	76.18	34.45	2006	181.40	28.40

The deposits of deep alluvial brick earth found covering the lower slopes of the North Downs has a contributory factor to the uniqueness East Kent Goldings. The soil is moisture retentive which is important as the effect of the Downs on rainfall in East Kent gives an average of around 635 mm per annum and a lower humidity than other English hop growing districts.

East Kent is adjacent to London where historically there was a large casual labour pool. Today regular employment is provided for the growing of the crop and maintenance of plant wirework and machinery. Casual labour is extensively employed for training the young shoots in spring and for harvesting. For example 100 hectares of hops requires 5 regular staff, 25 casual staff for training in May and 120 casual staff for harvesting in September. The delicate aroma of the East Kent Golding is recognized and appreciated by brewers of fine ales and beers, both in the UK and USA. Brewers often use the words East Kent Goldings on the labels of their containers. East Kent Goldings regularly command a premium price for a unique raw material. They offer delicate floral aromas of lightly sweet lemon. The hops are supremely elegant but with a mineral quality which gives backbone and structure to the beers. Among award winning beers and ales are Fullers 1845, Hop Back Summer Lightning and Boston Brewing Co Ales from the USA.

An annual hop festival is held in Faversham at the commencement of the harvest. Visitors from many countries come to see the hops and sample the finished product. A ceremony know as 'Hop Hoodening' is held in Canterbury at the start of the harvest each year to bless the hops, and local churches often hold a special service at the end of harvest to give thanks for the harvest.

#### **4.7 Inspection body:**

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**The inspection body conforms to the principles of EN 45011 standard.**

#### **4.8 Labelling:**

