



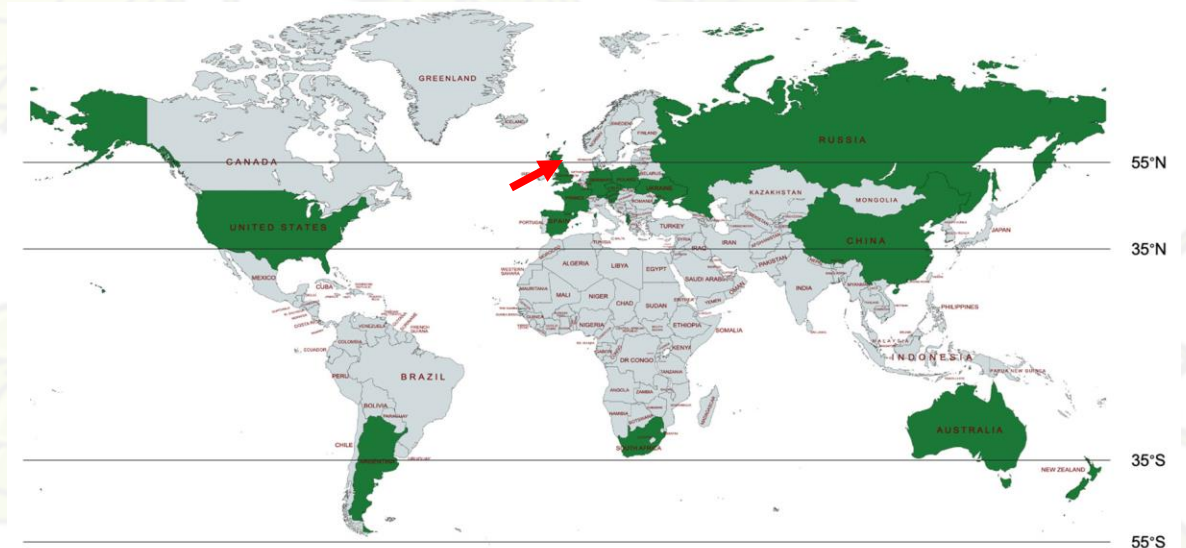
Minnesota Hop Growers Annual Meeting

9th March 2024

Hop growing in the UK
Dr Klara Hajdu

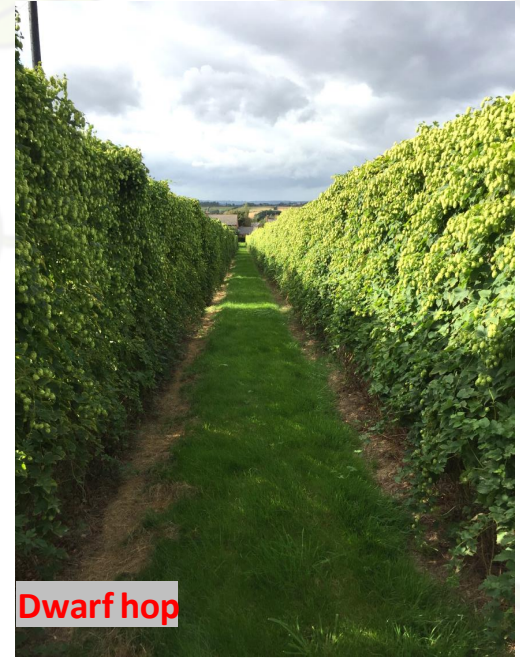
UK hop growing

- Hops need short days to grow profitably (35°-55°latitudes)
- UK hops commercially grown in the South-East of England and in the West Midlands
- 50 commercial hop growers



UK hop growing

- 120+ days growing season
- Winter chilling requirement
- Chalky (South-East) loamy (West Midlands) well draining soil, pH 6.5-8
- Tall (conventional) and dwarf (short trellis) hops
- All processes done on individual farm including processing and packaging of hops



Dwarf hop



Tall hop

Hop growing in the UK

Trellis system

- Trellis system:
- Conventional (tall) or dwarf (low wirework)

Tall hops:

- 6 m 19ft
- Yield 1-2.3 t/ha
- Permanent poles and wirework
- Permanent screw pegs
- Annually installed coir strings
- 2 strings/plant
- Hand harvested



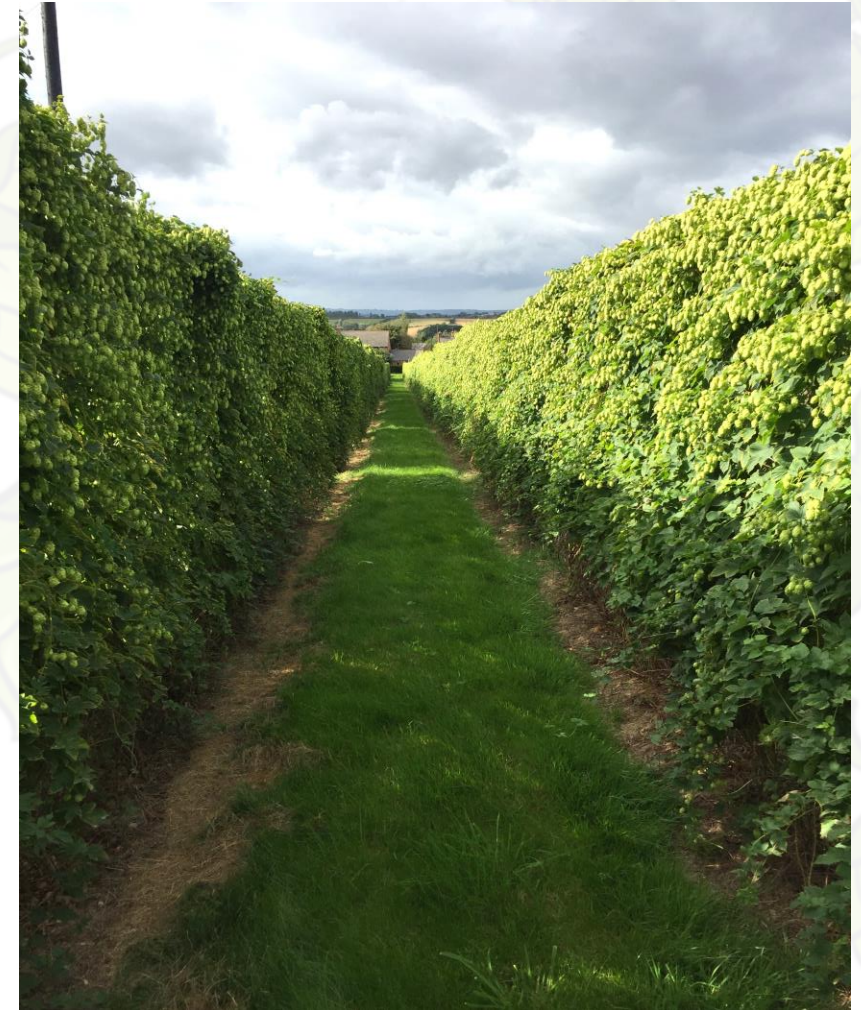
Hop growing in the UK

Trellis system

- Trellis system:
- Conventional (tall) or dwarf (low wirework)

Dwarf hops:

- 10 ft
- Yield 20-30% less than conventional
- Permanent plastic net structure
- Old bines (strigs) cut off in the spring
- Mechanically harvested (modified blackcurrant harvester)



UK hop growing

Annual tasks

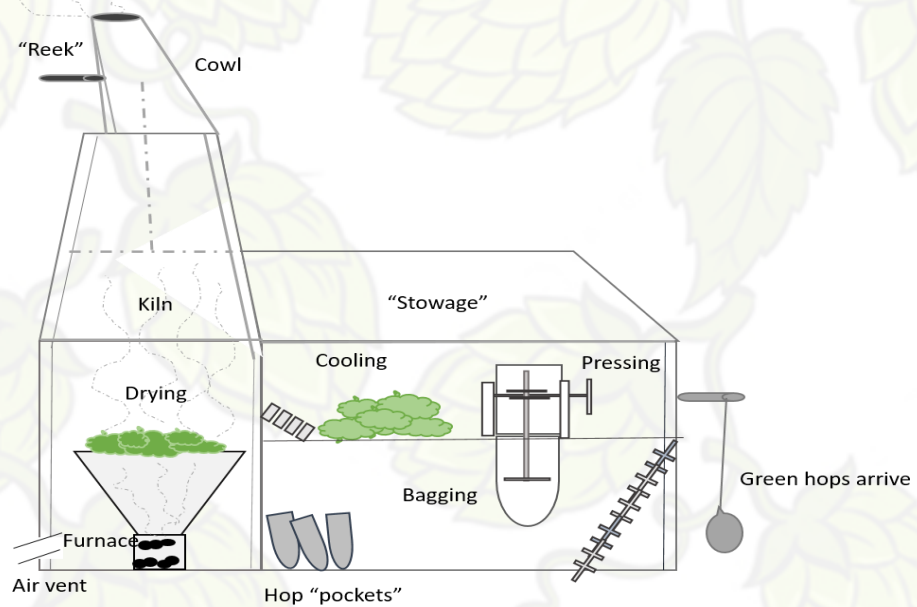
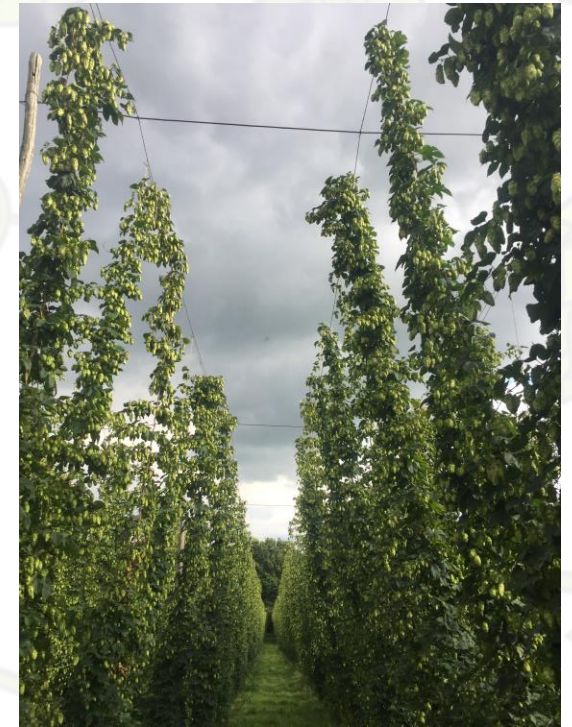
- **Cultivation**
Eliminating weed
- **Planting rhizomes**
Early spring
March April
Pole “monkey”, continuous coir string
- **Training or “twiddling”**
Late April - May
Clockwise training 2-3 bines
Dwarf varieties self train
- **Crop walks, P&D control**
Throughout
Preventative spraying: mite, aphid, PM, DM



UK hop growing

Annual tasks

- **Harvest** September-October
Cutting down whole bines, including coir strings
Dwarfs picked mechanically
- **Processing, drying and packing** September-October
Same principles slightly different techniques
Cleaning cones from leaves, kiln drying to 10% moisture content



Hop growing in the UK

Annual tasks summary

	Dwarf	Tall	Physiological phase
January		Cutting off old bines	Dormant
February			
March	Weeding, cutting old strigs front mounted rubber flail	Weeding/ cultivation if new planting	First shoots
April	Self-train, downy control	Screw pegging, stringing, downy control	
May		Training	Vegetative
June		Burning off	
July	P&D	Irrigation/P&D	Burr
August			Cone
September	Harvest/processing		Maturity
October			
November			Senescing
December			

UK hop growing – Growers and distribution

- 3 grower groups

English Hops Ltd (EHL), South-East - 50% of total hop acreage

Charles Faram Farms (CFF), West Midlands- 20% of total hop acreage

Wealden Hops – SE and WM 30% of total hop acreage

- Growing area/farm 2ha-50ha

- Distribution of hops

Merchants: Charles Faram, Lupofresh, Hopsteiner

Co-ops: EHL, Wealden Hops

Directly to breweries



UK hop growing

- 34 UK hop varieties in commercial production
 - Public varieties
 - Landrace varieties
 - Private varieties
- 1400 acres total hop production

Variety	Alpha Range	Characteristics	Flavour Intensity
Admiral	13-16	Resinous, orangey, citrus.	9
Cascade (UK)	5.3-6.8	Lychees, floral, grapefruit.	9
Harlequin®	9.5-12	Passionfruit, peach, pineapple.	9
Jester®	7-9	Grapefruit, tropical fruits.	9
Target	8.5-13.5	Sage, citrus, spice.	9
Bramling Cross	6-8	Spicy, blackcurrant, lemon.	8
Bullion	5.3-9.5	Blackcurrant, spicy.	8
Ernest	5.3-6.3	Apricot, citrus, spice.	8
Olicana®	6-9	Mango, grapefruit, passionfruit.	8
Pioneer	8-10.5	Cedar, grapefruit, herbal.	8
Challenger	6.5-9	Spicy, cedar, green tea.	7
Endeavour	8-10.5	Blackcurrant, spicy, citrus.	7
Flyer	8.3-14.5	Spicy, citrus, liquorice, resinous	7
Mystic™	4-6.5	Blackcurrant, Citrus, Passionfruit	7
Northdown	7-10	Spicy, floral, pine.	7
WGV	5-7.5	Spicy, herbal, floral.	7
Archer®	4-6	Floral, lime, peach.	6
Beata	3-6	Honey, apricot, almond.	6
Boadicea	7-10	Spicy, light, floral.	6
East Kent Goldings	4-6	Spicy, honey, earthy.	6
Epic	3-5	Fruity, slightly herbal.	6
First Gold	6.5-10	Orange, marmalade, spicy.	6
Fuggle	3.5-6.5	Minty, floral, earthy.	6
Godiva™	6-9	Spicy, Gooseberry, Tangerine	6
Goldings	4-9.5	Spicy, honey, earthy.	6
Keyworths Early	5.6-8.3	Grapefruit, lemon.	6
Minstrel®	5-7	Spicy, berries, orange citrus.	6
Pilgrim	9-13	Spicy, citrus, pears.	6

UK hop growing – Varieties grown

- **Mostly public UK varieties:**
 - Tall aroma: Fuggle, Goldings, Challenger, Bramling Cross, WGV, Progress
 - Dwarf aroma: First Gold, Endeavour, Sovereign
 - Tall alpha: Admiral, Target, Pilgrim, Bullion, Phoenix
- **Some Charles Faram UK varieties:** Harlequin, Olicana, Jester, Mystic etc
- **Some public USA varieties:** Cascade, Centennial

UK hops used by breweries

UK hops: 20% of total hops used by breweries

The other 80% being imported

Trend: UK hops heavily replaced by high impact aroma hops

from USA, NZ, Germany

Hops grown in UK	2022 (total acreage)	2023 (total acreage)
UK Aroma	1072	859
UK Alpha	338	299
Other	193	208
Total	1603	1366

UK aroma down: reduction in traditional pale ale, bitter and mild sales in pubs through COVID

Alpha steady: although some Pilgrim grubbed due to price competition from high alpha USA and German vars.

The UK needs high aroma hops like Citra and Nelson

UK hops used by breweries

Recent challenges and opportunities

- Import substitution: breweries developing a need for locally produced raw ingredients
- Low carbon footprint, sustainably produced hops
- Climate change... Varieties adapted to local climate?
- Retraining the consumer?



Objectives for BHA crosses

2024	Climate resilience
2023	High impact flavour , progeny testing of new, “flavour males”
2022	Improved flavour with durable PM resistance , improved flavour with high alpha
2021	Diverse aromas
2020	Geraniol markers
2019	Marker validation , Flavour
2018	Triploid dwarf , Flavour , Aphid resistance . with aroma
2017	Winter dormancy , Impact aroma
2016	Wilt resistant Fuggle , Wilt resistance improvement
2015	Genetic marker populations (Klara’ PhD)
2014	Homozygous males , Aroma
2013	Wild USA, Disease resistant males
2012	Spicy aroma, Aphid resistant new males
2011	USA aroma , Low selinene dwarfs, Use of new males
2010	Fuggle aroma, powdery mildew resistant males