

TANGO – the New Hüll Aroma Cultivar



Progress in Breeding: Brewing Quality, Climate Tolerance and Sustainability

A. Lutz, J. Kneidl, D. Ismann, E. Seigner
and Hop Breeding Team

Cooperation: Dr. Kammhuber and Team

Hop Growers

Brewers

Coping with the Challenges in Hop Production

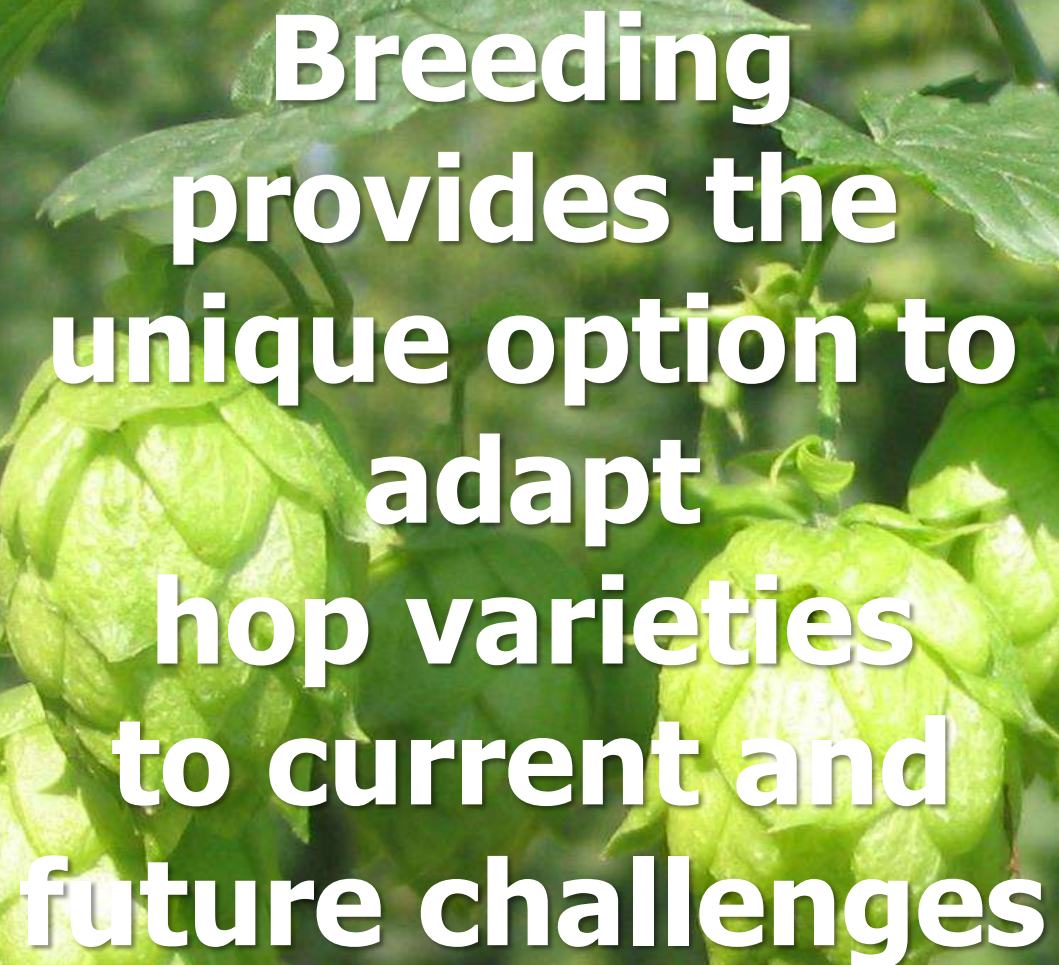
- New Modern Hop Cultivars are Crucial

- Excellent **brewing quality and supply reliability** are first priority
- **Competitiveness on the global hop market** has to be guaranteed – also in the future
- **Improved environmental and resource management** are necessary (reduced fertilization, water protection, climate neutrality ...)
- **Climate change requires „true all-rounders“** (to endure extreme weather conditions, wetness, droughts, heat, storms, sun/UV irradiation)
- **Increasing challenges with** already known and new **diseases and pests** (Citrus Bark Cracking Viroid...)
- **Significant reduction of chemical plant protection** is needed (reduced range of chemicals, less applications, preventing problems with residues)



Tango

Hop Research Center Hüll - Competence in Breeding



**Breeding
provides the
unique option to
adapt
hop varieties
to current and
future challenges**

Development of **TANGO**, the Modern & Market-Oriented Aroma Cultivar

- based on **broad knowledge** and by
- use of **comprehensive selection systems in the greenhouse, lab and field** (Verticillium wilt, powdery and downy mildew)
- **growth trials at various locations** (Hallertau, Spalt, Tettwang, Elbe-Saale region)
- **biotechnological & molecular-diagnostic methods** to ensure healthy planting material (free of Verticillium, viruses and viroids)
- and by **genome based precision breeding** in the near future

Tango – the Future-Oriented Cultivar from Hüll

Origin	Cascade/Hall. Tradition x Hüll Aroma lines
Benefits	<ul style="list-style-type: none">➤ vigorous and homogeneous growth➤ good twining➤ good cone set, compact cones➤ high nutrient / nitrogen efficiency
“Low input”	
“Low input”	advantageous proportion of cone to residual plant (bine, laterals and leaves) resulting in <ul style="list-style-type: none">➤ reduced used of nitrogen➤ reduced or no irrigation➤ reduced amounts of pesticides /chemicals
“High output”	<ul style="list-style-type: none">➤ high oil content of cones➤ high alpha acid contents➤ high yield (above Hall. Tradition and Perle)
Climate tolerance	very good with stable, reliable yield and alpha acids



Tango

Tango - Disease and Pest Resistance

Testing in the Hüll breeding yard - under "low input" conditions:

- drastically reduced fertilization (50 kg N/ha below recommended amount in practice)
- minimum application of plant protection chemicals
- no irrigation
- comprehensive knowledge through tests in the lab, green house & fields

Resistance /Tolerance to	
Verticillium wilt	so far good
Downy mildew (DM)	good
Powdery mildew (PM)	resistant
Botrytis	good
Red spider mite	medium - good
Hop aphid	medium - good

-> resulting in reduced application of chemicals

Tango –

Cone Compounds & Aroma stand for Brewing Quality



Bitter substances (EBC 7.7) in % (w/w):

alpha acids: 9.0 (7.5 – 11)

beta acids: 8.5 (6 – 10)

cohumulone: 23 (20 – 25)

Xanthohumol: 0.6 (0.5 – 0.8)

Total oil (EBC 7.10):

3.0 (2.4 – 4.0) ml /100 g

Aroma of raw hops:

wide spectrum of aroma notes

pleasantly hoppy and green notes,

resinous and woody nuances, citrusy, fruity

TANGO – an All-Rounder in Brewing

➤ Comprehensive brewing trials e.g. with

- Bitburger Trial Brewery
- TUM Research Brewery Weihenstephan
- BarthHaas
- breweries of GfH members and home brewers

➤ **Tango** proves to be an all-rounder in brewing:

- kettle hopped beers: **hoppy fresh aroma notes** similar to Hallertauer Tradition and Perle
- in late and dry hopped beers: **fresh and fruity aroma** (especially passion fruit)
- pleasantly mild bitterness
- excellent drinkability

Tango is our latest cultivar following in the footsteps of its grandmother “Hallertauer Tradition” while being the pacemaker into the future.

(Dr. Möller, Chairman Society of Hop Research)



Availability of Tango



- **Tango** has been applied for grant of **EU Plant Variety Rights** in 2020
- increasing acreage as of spring 2021, **samples for trial brews** available through **GfH** on request to

gfh@hopfenforschung.de

- as of fall 2022 available for all brewers on the hop market on commercial scale



TANGO – New Hüll Aroma Cultivar – Combining Brewing Quality, Supply Reliability and Sustainability

Classical hop varieties such as **Hallertauer Tradition and Perle** are much in demand with brewers worldwide and are fixed components of many beer recipes.

But – management of **climate change and environmental protection** require **changes in hop production** to ensure supply reliability of raw material.

TANGO represents the **future-oriented alternative** to Hallertau Tradition and Perle in providing

- high **yield**
- stable **high alpha acid contents**
- **supply reliability** by **climate tolerance**
- **“low input – high out”** contributing to **sustainability**
- **excellent aroma potential** in many beers



Many Thanks for Your Interest!

**The Hüll Breeding Team and the Society of Hop Research
are grateful to all cooperating
growers, brewers and partners!**



Hopfenforschungszentrum Hüll



Tango

