



Czech flavour hop cultivars

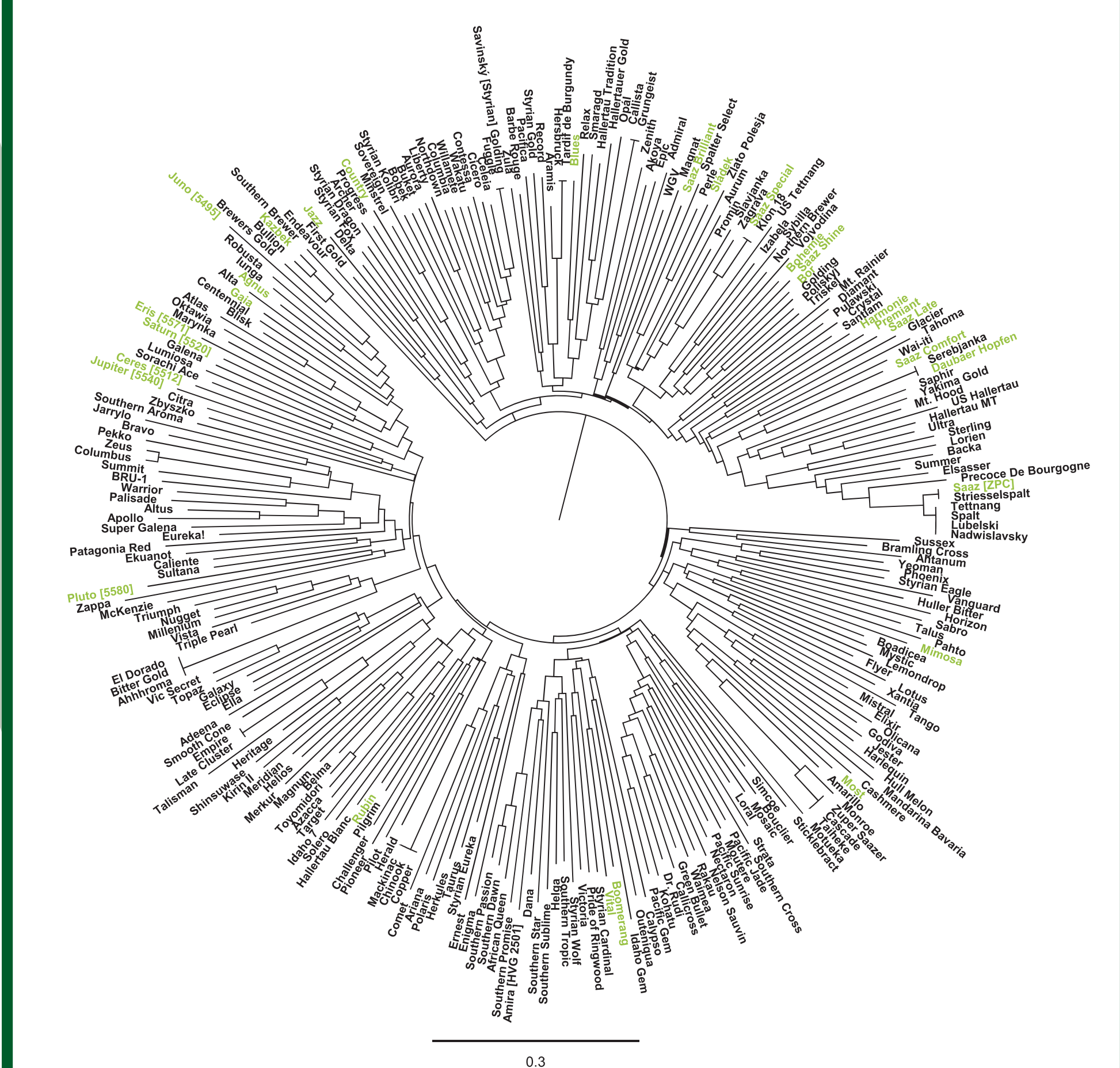
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Historically, the fine aroma Saaz hops has only been cultivated in the Czech Republic. Since 1994, aromatic cultivars Sládek, Premiant, Harmonie, etc. have been gradually registered. Since 2001, bitter cultivars Agnus, Rubín, Vital, Gaia and Boomerang have been registered. All Czech hop cultivars were produced only for lager style beer. As in other countries, a number of craft breweries has been increasing in the Czech Republic. They also focus on top-fermented beers and a new need arose for flavour hop cultivars. Kazbek is the first Czech flavour cultivar (2008), which originates from Russian wild hops. The aroma is soft and intense citrusy, with herbal, fruity and spicy background. It is the most yieldy Czech hop cultivar (2.5 to 4.0 t/ha), grown on 22 ha yet. The next flavour cultivar Mimosa (2018) has fruity and citrusy (lemon, lime, grapefruit, tangerine) aroma. The content of alpha (1.0 to 2.5% w/w) and beta acids (3.5 to 6.0% w/w) is an unusual. Mimosa is a cross between Czech origin mother line of and South African male plant. Hop breeding for flavour hops is aimed at lower content of alpha acids (4 to 8 %), so that hops do not affect the character of beer bitterness during dry hopping. Between 2011 and 2014, 35 crosses were made for flavour hops. The result is the registration of a new series of Czech cultivars. Breeding was based on Kazbek cultivar and five its daughter lines were registered as Juno, Ceres, Saturn, Jupiter and Eris cultivars. Juno is interesting that Canadian wild male plant was used for pollination. Last Pluto cultivar is a cross between aroma cultivar Harmonie and Saaz male plant. Cultivars have different aromas – Juno (fruity and citrusy), Ceres (citrusy and sweet fruity), Saturn (sweet and tropical fruity, citrusy), Jupiter (woody, herbal, floral), Eris (intense citrusy) and Pluto (fruity, herbal, woody). The content of alpha acids is from 4.5% w/w (Juno, Ceres) to 8.5% w/w (Saturn, Eris). All of cultivars have the minimum yield of 2 t/ha, except for Eris cultivar (1.7 t/ha). All of cultivars have found a use in craft breweries and they are very popular. Because of big demand, it is necessary to enlarge their production. Currently, we continue this breeding and new perspective breeding lines have a chance to enlarge and supply other specific aromas.

Genetic map of hop varieties



Kazbek

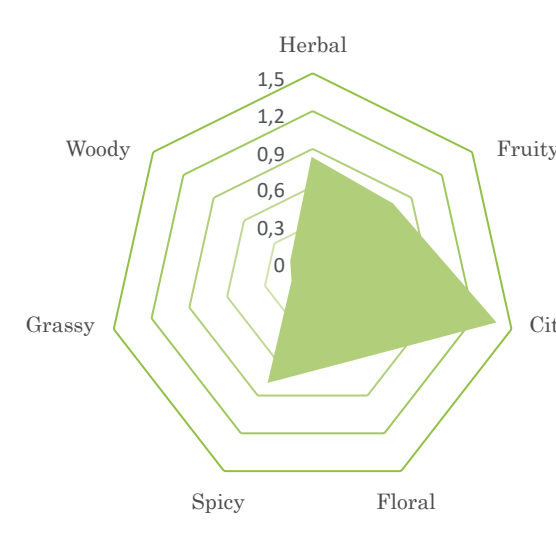
IHGC VARIETAL CODE: **KAZ**

DESCRIPTION

The Kazbek variety was obtained by selection from offspring with a large proportion of Russian wild hops. It was registered in 2008 as the first Czech "flavour" aroma hop with herbal, spicy and intense citrusy aroma. Applicable for the second, late and dry hopping of beers and ales, excellent in wheat beers.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
2.0-2.8 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		0.9-2.0
Alpha acids	5-8	Myrcene*	20-45
Beta acids	4-6	Linalool*	0.3-0.8
Cohumulone*	34-40	Geraniol*	<0.2
Colupulone**	57-62	Caryophyllene*	10-15
Xanthohumol	0.30-0.40	Farnesene*	<1.0
		Humulene*	15-30
		Selinene*	2-5

* as % of alpha acids
** as % of beta acids
* % of total oil

Mimosa

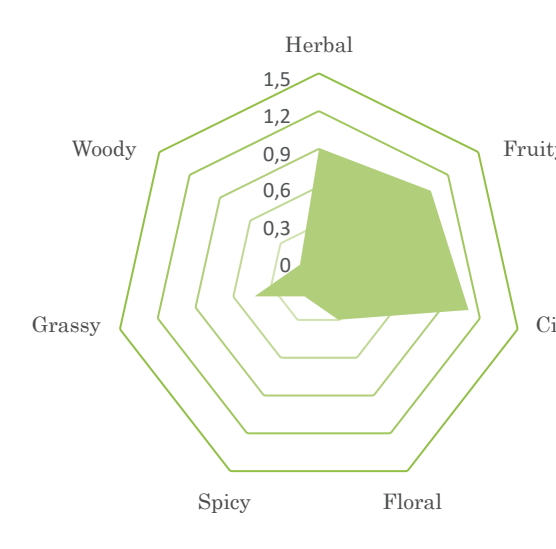
IHGC VARIETAL CODE: **MIM**

DESCRIPTION

Mimosa variety, registered in 2019, is a seedling of Agnus daughter and South African male. Low alpha acid content contrast with high content of beta acids. The fruity and citrus (lemon, lime, grapefruit, tangerine) aroma is low intensity.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.3-2.0 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		0.4-1.0
Alpha acids	1-2	Myrcene*	15-35
Beta acids	3.5-6.0	Linalool*	0.4-1.1
Cohumulone*	25-35	Geraniol*	<0.2
Colupulone**	50-60	Caryophyllene*	5-8
Xanthohumol	0.35-0.45	Farnesene*	<1.0
		Humulene*	1-4
		Selinene*	25-45

* as % of alpha acids
** as % of beta acids
* % of total oil

Ceres

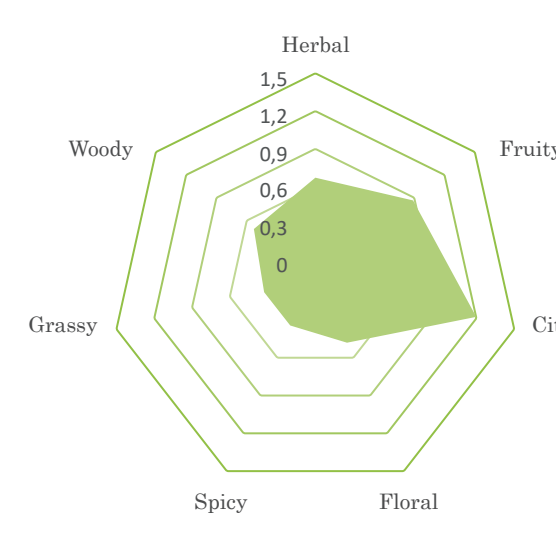
IHGC VARIETAL CODE: **CES**

DESCRIPTION

Seedling of Kazbek. Intense aroma of green (apple, pear), citrus (lemon, lime, grapefruit, orange) and sweet (apricot) fruits mixed with herbal (mint), spicy (star anise), woody (bark, tobacco) and grassy (tomato leaves, fresh cut grass, nettle) aroma. It was registered in 2023.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.6-2.1 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		0.9-1.5
Alpha acids	4.5-7.0	Myrcene*	20-40
Beta acids	2.5-4.5	Linalool*	0.3-0.7
Cohumulone*	33-40	Geraniol*	<0.1
Colupulone**	50-58	Caryophyllene*	10-15
Xanthohumol	0.25-0.40	Farnesene*	<1.0
		Humulene*	20-35
		Selinene*	1-3

* as % of alpha acids
** as % of beta acids
* % of total oil

Eris

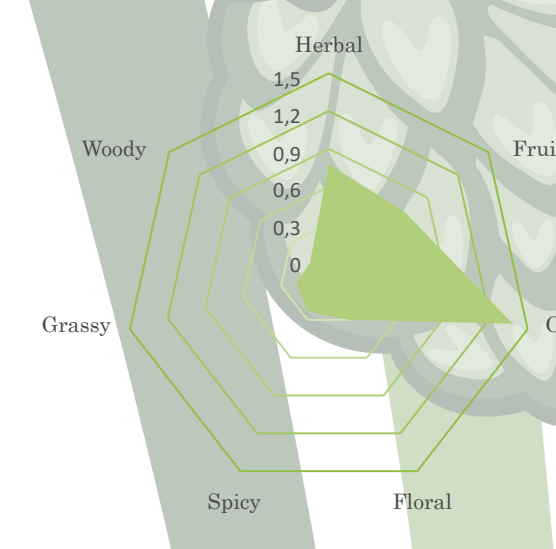
IHGC VARIETAL CODE: **ERI**

DESCRIPTION

Seedling of Kazbek. High intense aroma of citrus (lime, grapefruit, tangerine, orange) and tropical fruits with floral (lemon, orange, black currant, elder), herbal (lavage, lemon balm, green herb) and piny notes. It was registered in 2023.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.4-3.0 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		1.0-2.0
Alpha acids	6.0-8.5	Myrcene*	20-40
Beta acids	4-6	Linalool*	0.3-0.6
Cohumulone*	45-51	Geraniol*	<0.1
Colupulone**	70-75	Caryophyllene*	10-15
Xanthohumol	0.30-0.45	Farnesene*	<1.0
		Humulene*	20-30
		Selinene*	2-4

* as % of alpha acids
** as % of beta acids
* % of total oil

Juno

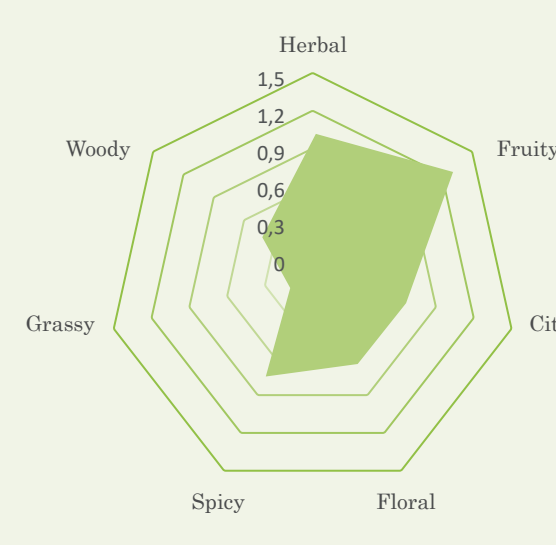
IHGC VARIETAL CODE: **JUN**

DESCRIPTION

Seedling of Kazbek and wild Canadian male. High intense aroma of apple, citrus (lemon, lime, zest, tangerine, orange), sweet and tropical fruits (banana, mango, honeydew melon) with gentle floral, piny and spicy notes in background. It was registered in 2022.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.7-2.2 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		0.9-1.5
Alpha acids	4.5-6.0	Myrcene*	40-60
Beta acids	3.5-4.5	Linalool*	0.7-1.3
Cohumulone*	35-42	Geraniol*	0.1-0.3
Colupulone**	58-65	Caryophyllene*	9-14
Xanthohumol	0.30-0.40	Farnesene*	<1.0
		Humulene*	2-7
		Selinene*	4-8

* as % of alpha acids
** as % of beta acids
* % of total oil

Jupiter

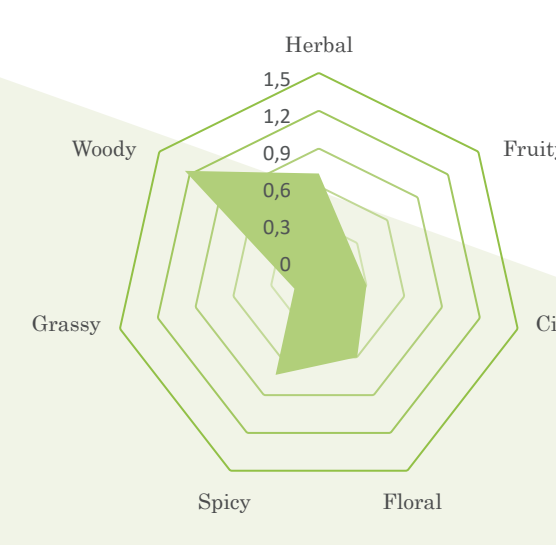
IHGC VARIETAL CODE: **JUP**

DESCRIPTION

Seedling of Kazbek. High intense citrusy and fruity (apple, pear, sweets) aroma with floral (jasmine, rose), herbal (mint, lemon balm), spicy (star anise, bay leaf) and woody (resin, pine, needles) notes in background. It was registered in 2022.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.7-2.3 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		0.5-1.0
Alpha acids	3-5	Myrcene*	30-50
Beta acids	3-4	Linalool*	0.5-0.8
Cohumulone*	25-30	Geraniol*	0.2-0.4
Colupulone**	40-50	Caryophyllene*	9-13
Xanthohumol	0.20-0.25	Farnesene*	<1.0
		Humulene*	3-8
		Selinene*	5-10

* as % of alpha acids
** as % of beta acids
* % of total oil

Pluto

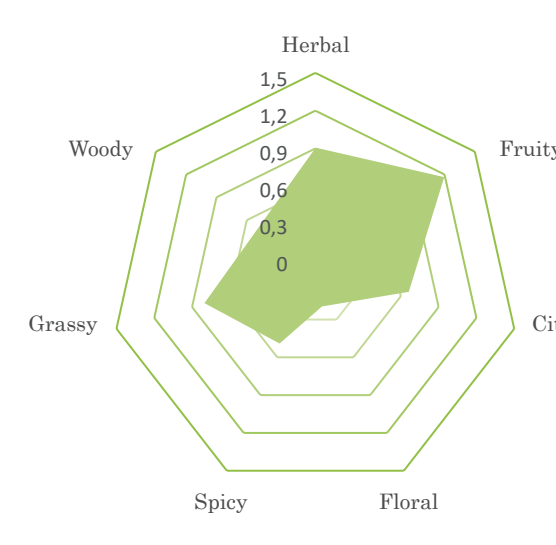
IHGC VARIETAL CODE: **PLU**

DESCRIPTION

Seedling of Harmonie and Saaz male. High intense fruity (green fruits, lemon, pineapple, banana), sweet (yoghurt, almond, vanilla) and woody (needles) aroma with herbal (mint, menthol, basil, chamomile, green tea) and vegetal (root vegetable, asparagus) notes in background. It was registered in 2022.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.7-2.2 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		1.0-2.0
Alpha acids	6-8	Myrcene*	20-40
Beta acids	4.5-6.0	Linalool*	0.4-0.8
Cohumulone*	20-25	Geraniol*	0.3-0.6
Colupulone**	43-49	Caryophyllene*	8-12
Xanthohumol	0.20-0.30	Farnesene*	<1.0
		Humulene*	20-30
		Selinene*	1-4

* as % of alpha acids
** as % of beta acids
* % of total oil

Saturn

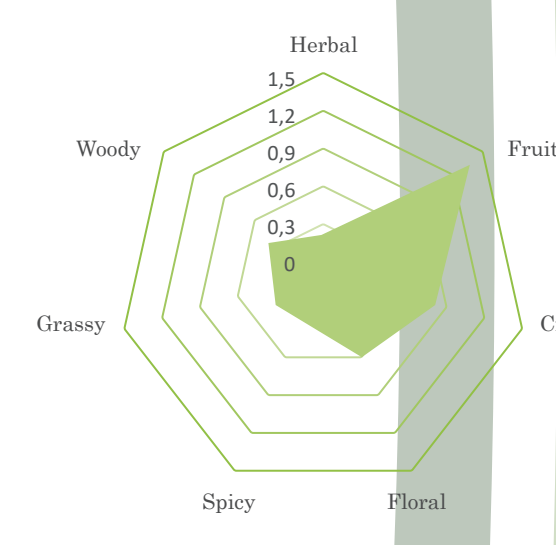
IHGC VARIETAL CODE: **STN**

DESCRIPTION

Seedling of Kazbek variety. Intense aroma of citrus (lemon, lime, tangerine, grapefruit, orange), sweet and tropical (apricot, peach, watermelon, mango) fruits mixed with floral (citrus, rose), spicy (chili, black pepper, anise), vegetal (garlic, parsley green) and woody (pine, needles) notes. The variety was registered in 2022.



HOP AROMA



AGRONOMY

MATURITY					
EARLY	SEMI-EARLY	MEDIUM	SEMI-LATE	LATE	
earlier 20/08	20/08-01/09	01/09-05/09	05/09-15/09	later 15/09	

YIELD
1.9-2.5 t/ha

HOP CHEMISTRY

BITTER COMPONENTS		AROMA COMPONENTS	
	Range (%)		1.5-2.5
Alpha acids	5.5-9.0	Myrcene*	30-45
Beta acids	3-5	Linalool*	0.4-0.7
Cohumulone*	40-50	Geraniol*	<0.1
Colupulone**	60-68	Caryophyllene*	8-14
Xanthohumol	0.30-0.50	Farnesene*	<1.0
		Humulene*	20-35
		Selinene*	1-3

* as % of alpha acids
** as % of beta acids
* % of total oil

Acknowledgement

This article was written within the project NAZV QK21010136 entitled "Application of new hop varieties and genotypes resistant to drought in hop growing and beer brewing" of the Czech Ministry of Agriculture.