New Varieties

Hop Varieties Bohemie and Saaz Late

Registered: Czech Republic, 2010 and 2011

Breeders' rights: Hop Research Institute, Co., Ltd., Žatec, Czech Republic

Breeder and maintainer: Hop Research Institute, Co., Ltd., Žatec, Czech Republic

Pedigree: Bohemie – a cross between the Sládek cultivar and breeding material that originated from Saaz semi-early red bine hop

Saaz Late – breeding material that originated from Saaz semi-early red bine hop × open pollination

Breeding method: Bohemie was obtained after selection within the F_1 generation progeny derived from the mother plant of Sládek cv. Saaz Late was produced by selection in the F_1 generation progeny that had its origin in Saazer. The progenies were artificially infected with powdery mildew (*Podosphaera humuli*) under glasshouse conditions. Resistant plants were planted onto our breeding plot and tested for resistance to downy mildew (*Peronoplasmopara humuli*). Selected clones No. 4837 (Bohemie) and 4237 (Saaz Late) were planted onto the 2nd breeding stage plot. As the clones showed good parameters after four years' assessment within this stage, they were propagated and planted onto the 3rd breeding stage plots in three replicates to examine the stability of demanded breeding characteristics. Brewing tests in a pilot brewery were carried out and the clones were further propagated for field trials on Stekník hop farm in 2007. In 2008 they were included into registration trials and in 2010 they were registered as the varieties Bohemie and Saaz late Ametyst, which was renamed to Saaz Late in 2011.

Resistance to diseases: Both cultivars show very good tolerance to main fungal diseases. They are resistant to hop powdery mildew and medium resistant to hop downy mildew.

Chemical composition of hop cones: On the basis of the results obtained from registration trials both varieties could be included in the group of aroma hops. As shown in Table 1, the Bohemie variety had the respective contents of alpha and beta acids 5–8% and 6–9%, while in Saaz Late the contents amounted to 3.5–6.0% and 4.0–6.5%. A good ratio between alpha and beta acids is the main reason why both cultivars were included in the aroma hop group. The cohumulone ratio ranged between 23% and 26% rel. in Bohemie and between 20% and 25% rel. in Saaz Late, whereas the colupulone ratio was between 40% and 45% rel. and 39% and 43% rel., respectively. The content of polyphenols ranged from 1.8 to 2.5% w/w in Bohemie and from 2.5 to 3.0 % w/w in Saaz Late. Higher ratio of myrcene and humulene, average ratio of caryophyllene and selinenes and very low ratio of farnesene are typical of Bohemie as for the composition of its essential oils. Higher ratio of farnesene, myrcene and humulene, average ratio of caryophyllene and low ratio of selinenes are characteristic of Saaz Late.

Other characteristics: 2.0–2.6 t/ha of dry cones was the average yield of both varieties in registration trials. This is the main advantage in comparison with standard varieties Saaz (0.8–1.2 t/ha) and Sládek (1.8–2.5 t/ha). Hop cones are firm and easy to pick, which helps to decrease losses during harvest. The size of cones can be considered as equal, which is a very important characteristic influencing hop drying. Bohemie has vigorous growth and regularly cylindrical shape. The red bine is 10–13 mm thick; fertile laterals are of medium size. The weight of 100 cones, which are in bunches medium and oval, amounts to 17–20 g. The rachis is regular and 16–20 mm long. Saaz Late has vigorous growth and irregularly cylindrical shape. The violet bine is 10–13 mm thick; fertile laterals are very long.

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Table 1. Chemical characteristics of dry hop cones for Bohemie and Saaz Late in comparison with standard varieties

Variety	Saaz	Sládek	Bohemie	Saaz Late
Hop resins				
Total resins (% of DW)	13–20	17–24	22–26	15–22
Alpha acids (% of DW)	2.5–4.0	4.5–6.5	5.0–8.0	3.5–6.0
Beta acids (% of DW)	4.0–6.0	4.0–6.5	6.0–9.0	4.0–6.5
Alpha/beta ratio	0.6–0.9	0.7–1.3	0.8–1.0	0.8–1.0
Cohumulone (% rel. in AA)	23–26	25–31	23–26	20–25
Colupulone (% rel. in BA)	39–43	45–51	40–45	39–43
Polyphenols				
Total polyphenols (% of DW)	4.5–6.0	3.0–4.0	1.8–2.5	2.5–3.0
Xanthohumol (% of DW)	0.3–0.5	0.5–0.75	0.5–0.75	0.30–0.50
DMX (% of DW)	0.05–0.10	0.1–0.2	0.1–0.2	0.07–0.12
Essential oils				
Total essential oils (% of DW)	0.4–1.0	1.0–2.0	1.0–1.5	0.5–1.0
Myrcene (% rel. in TO)	25–40	40–50	30–40	25–35
Caryophyllene (% rel. in TO)	6–9	8–13	7–10	6–9
Humulene (% rel. in TO)	15–25	20–30	17–23	15–20
Farnesene (% rel. in TO)	14–20	< 1.0	< 1.0	15–20
Alpha and beta selinenes (% rel. in TO)	0.5–1.5	0.5–1.5	8–12	3–4

DW – dry weight; AA – alpha acids; BA – beta acids; TO – total oils

They begin to grow 2.5–3.0 m above the ground level. The cones are medium and have an oblong shape. The weight of 100 cones amounts to 10–15 g. The rachis is regular and 15–17 mm long. The genuine delicate hop aroma of hop cones is characteristic of both these varieties. Vegetation period lasts for 128–135 days.

Limited quantity of planting material is possible to deliver for research and breeding purposes.

Ing. Vladimir Nesvadba, Ph.D.
Hop Research Institute, Co., Ltd., Kadaňská 2525, 438 01 Žatec, Czech Republic
tel.: + 420 415 732 111, fax: + 420 415 732 150, e-mail: nesvadba@chizatec.cz