BREEDING LOW TRELLIS HOPS IN CZECH REPUBLIC

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INTRODUCTION:
In the past hop breeding in Czech Republic was based on just clonal selection with the aim to improve Saazer. Nevertheless, the objectives have changed considerably recently. Hop cones contain numerous important compounds for brewing industry, pharmaceutical and bio-medicine (De Keukeliere et al., 2003; Plenářová et al., 2010). Technological changes in hop growing have been made recently, including low trellis systems (Nesvadba et al., 2001). Whereas classic technology consists in hop growing in 4-5m high trellis systems, low trellis is just 3m tall. This change brings about lower need of labor and pesticides. The reason why there are no convenient varieties at disposal lies in low interest of hop growing countries, except the UK (Greenstreet, 2000). Nevertheless, problems with the lack of seasonal labor and high costs connected with it have made hop growers try to change their traditional system of hop growing. Therefore, we have made contact with our English colleagues who are more experienced in this unusual system of hop growing to develop new suitable dwarf varieties for cultivation in CR.

MATERIAL AND METHODS:
We obtained 19,000 seeds from the crossings realized in the UK in 2010. Saazer - Osvald-clones no. 31 was used for the crossing. It was pollinated by English male plants from the collection of the unique gene fond of dwarf hops. For hop crossing carried out in CR four mother plants with dwarf characteristics were chosen from the breeding collection. Totally 2,000 seeds were obtained from pollination. The first assessment of hop plants was carried out in 2011. Qualitative features were evaluated in all the plants. On the base of these results we selected the best ones with the aim to get new genotypes suitable for growing in low trellises. Length and position of internodes, habitus of hop plants and tolerances to diseases were the most important assessed characteristics (Darby, 2001). Totally 149 genotypes were chosen for further study. Descriptions before harvest were made. We evaluated bine color, number of bines, length and position of fertile laterals, size of cones as well as tolerance to diseases and pests. In the selected perspective genotypes hops were harvested by hand and hop yield was determined. In all the samples chemical analyses aimed at hop resins (liquid chromatography – HPLC, EBC 7.7) and essential oils (gas chromatography) were carried out. Length and position of internodes, habitus of hop plants and tolerances to diseases were the most important assessed characteristics (Darby, 2001). Totally 149 genotypes were chosen for further study. Descriptions before harvest were made. We evaluated bine color, number of bines, length and position of fertile laterals, size of cones as well as tolerance to diseases and pests. In the selected perspective genotypes hops were harvested by hand and hop yield was determined. In all the samples chemical analyses aimed at hop resins (liquid chromatography – HPLC, EBC 7.7) and essential oils (gas chromatography) were carried out.

RESULTS AND DISCUSSION:
Qualitative features were evaluated in all the plants as the base for the selection of the objective to get new genotypes suitable for growing in low trellises. Length of internodes and position of fertile laterals were the most important characteristics together with the growth of plants and tolerances to diseases. Totally 51 perspective genotypes were chosen for further breeding (Table 1). Bine color, number of bines, length and position of fertile laterals, size of hop cones and tolerance to pests and diseases were evaluated before harvest. The best genotypes were harvested so as to get their yields in kilograms of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional chemical analyses of hop resins and sensory perception evaluations were carried out as well. Perspective genotypes are shown in Table 2. The best genotypes PG 2/3 reached the yield of 3.52 kg of fresh hops per plant. If we take into consideration the spacing of 0.75 x 3.0 m and conversional