

MATĚJÍČEK, A.; KAPLAN, J.; MATĚJÍČKOVÁ, J.; VESPALCOVÁ, M. **Elderberry cultivar 'Haschberg'** [Odrůda černého bezu 'Haschberg'] p. 87-90

Cultivar 'Haschberg' was bred in 1965 in Austria from selection of wild population. Growth is medium vigorous, after beginning of fruitfulness is weaker. Tillering ability is medium. The cultivar can be successfully grown as bush or tree form. Height of unpruned bushes can reach six or seven metres. Inflorescence is rich, flat, five spoke, corymbic and usually large. Flowers are aromatic, yellowish-white, 6-9 mm wide, anthers are yellow. Hermaphrodite flowers produce large amount of pollen which is highly aromatic. Fruit is a purple-black, three-seeds and symmetrically round drupe. Drupe size is around 6-7 mm. Infructescences achieve high weights on the average. Flesh is dark red, juicy and has very good colourability. It is a very popular, standard cultivar, which is characterized by a very low susceptibility to diseases and pests. Fruitfulness is balanced, regular and relatively high. Elderberries of this cultivar almost do not fall off in ripe and overripe condition. The cultivar is primarily suitable for use in the processing industry for natural food colours and food supplements production, or for compotes.

Key words: elderberry, cultivar, 'Haschberg', description, evaluation

MATĚJÍČEK, A.; MATĚJÍČKOVÁ, J.; PAPRŠTEIN, F. **Evaluation of flesh firmness using FTA device in apples and pears stored in ULO** [Hodnocení pevnosti dužniny přístrojem FTA u jablek a hrušek skladovaných v ULO] p. 109-115

The aim of this study was to compare the flesh firmness of fruits of apple and pear cultivars stored in different ULO atmospheres, based on measuring the penetration on FTA instrument, and find the percentage decrease in flesh firmness of cultivars between the measurements in March and May. The experiment included 4 apple cultivars ('Gala', 'Jonagored', 'Rajka', 'Rubinola') and 4 pear cultivars ('Bohemica', 'Dita', 'Erika', 'Alexander Lucas') stored in three ULO atmospheres with different concentrations of O₂ and CO₂ (1 + 1 %; 2 + 2 %; 1 + 3 %) and a temperature of 1 °C. The penetration measurements were carried out on FTA (Fruit Texture Analyzer) device in March and May. The evaluation showed the most suitable atmosphere 1 % O₂ + 1 % CO₂ for apple cultivars 'Gala', 'Rubinola' and 'Jonagored', and 1 % O₂ + 3 % CO₂ for apple cultivar 'Rajka' compared with less suitable atmosphere 2 % O₂ + 2 % CO₂. The lowest decrease of flesh firmness from March to May measurement was found in cultivar 'Rubinola' in atmospheres 1 % O₂ + 1 % CO₂ and 1 % O₂ + 3 % CO₂ contrary to the highest decrease found in cultivar 'Rajka' in all observed atmospheres. A higher flesh firmness was detected in three of four pear cultivars ('Bohemica', 'Dita', 'Alexander Lucas') stored in atmospheres containing less CO₂ (1 % O₂ + 1 % CO₂ a 2 % O₂ + 2 % CO₂) compared to the atmosphere 1 % O₂ + 3 % CO₂. The flesh firmness of cultivar 'Erika' was balanced in all atmospheres. The lowest decrease of flesh firmness showed cultivar 'Bohemica', but only in atmospheres containing less CO₂. In contrast, the highest decrease was found in cultivar 'Dita' in all tested atmospheres.

Key words: flesh firmness, FTA, apples, pears, ULO storage

PROŠKOVÁ, A.; PAPRŠTEIN, F.; ŠTĚPÁNOVÁ HONZOVÁ, S.; KMÍNKOVÁ, M.; ŠETINOVÁ, I. **Influence of storage on allergen MAL d1 in apple cultivars** [Vliv skladování na výskyt alergenu Mal d1 u odrůd jabloně] p. 99-108

Sensitivity to the allergen Mal d1 was investigated in selected cultivars of apples harvested in 2009 and 2010, always stored to the spring of the following year in three modes of storage. There were three variants, namely consumer cellar (4-8 °C), storage box (2 °C) and storage in a controlled atmosphere ULO (Ultra Low Oxygen). Allergenicity of apples was investigated by methods in vivo and in vitro. It was a skin test prick to prick in the first case and immunological examination basophil activation testing in the second case. Results were confirmed by electrophoresis and Western blot with sera from patients manifesting allergy to apple. Joint evaluation of the methods used can be classified as the least allergenic variety 'Panenské české' and 'Ecolette'. Slightly worse results, though still a little allergenic cultivars are 'Braeburn', 'Melrose', 'Santana' and 'Hetlina'. The high allergenic cultivars after storage may be mentioned 'Resista', 'Angold', 'Topaz', 'Priscilla' and 'Golden Delicious'. In terms of storage, for all cultivars stored in controlled atmosphere was detected higher allergenicity to the skin tests and the Western blot.

Key words: apple, allergy, hypoallergenic, Malus domestica, Western blot, basophil activation, skin tests

PROŠKOVÁ, A.; PAPRŠTEIN, F.; ŠTĚPÁNOVÁ HONZOVÁ, S.; KMÍNKOVÁ, M.; ŠETINOVÁ, I. **Allergen MAL d1 in apple cultivars** [Výskyt alergenu MAL d1 u odrůd jabloně] p. 27-36

Sensitivity to the allergen Mal d1 was investigated in selected cultivars of fresh apples after harvest in 2009, 2010 and 2011. In 2009, there were 17 cultivars, in 2010 also 17 cultivars and in 2011 about 11 cultivars. Allergenicity of apples

was investigated by methods *in vivo* and *in vitro*. It was a skin test prick to prick in the first case and immunological examination basophil activation testing and Western blot in the second case. Joint evaluation of the methods used and all cultivars tested so far in terms of activities of allergen Mal d1 after harvest can be classified as the least allergenic cultivars 'Ecolette', 'Santana', 'Braeburn', 'Booskopské', 'Topaz' and 'Angold'. Cultivar 'Granny Smith' would be necessary to test more in the coming years. 'Panenské české' allergenicity has different values in different methods, in skin tests and by Western blot rather high, basophil activation by low to moderate. A similar situation occurs in the cultivar 'Jonagold', where the results by BAT and Western blot are low, but skin tests are based on a high. Cultivars 'Hetlina' and 'Florina' show great annual variability. The high allergenic cultivars after harvest can bring 'Resista' and 'Golden Delicious'. The one-year results as highly allergenic after the harvest comes variety 'Gala Schniga'.

Key words: apple, allergy, hypoallergenic, *Malus domestica*, Western blot, basophil activation, skin tests

ČEJKA, B.; MATĚJÍČEK, A.; MATĚJÍČKOVÁ, J.; PAPERŠTEIN, F. **Red currant cultivar 'Rubigo'** [Odrůda červeného rybízu 'Rubigo'] p. 79-81

Cultivar 'Rubigo' was bred by crossing 'Vierlandenský' x 'Kavkazský' in Breeding Station Velké Losiny, Czech Republic. Growth is vigorous, bush shape is higher and globular. Shoots are medium strength to strong, flexible, with abundant presence of fruiting spurs. Clusters are medium length to long, with long peduncle. On average, the cluster consists of 12 bigger-sized berries that ripen equally. Berries are dark red colour with a firm peel, sweetacidic and aromatic taste. The use of fruits is versatile - as a table fruit, also for freezing or juice production. Yield and colorability of juice are high. It is a middle early cultivar with high and regular yield that can be successfully harvested by mechanized harvest. It can be well grown also as a tree form. Health of the cultivar is good, plants are not susceptible to leaf spot and other fungal diseases. Pruning requirements are medium, severe pruning to ground level is well tolerated. Cultivar 'Rubigo' can be well propagated using hardwood cuttings.

Key words: red currant, cultivar, 'Rubigo', description, evaluation

ČEJKA, B.; STRAKOVÁ, D.; MATĚJÍČEK, A.; MATĚJÍČKOVÁ, J.; KAPLAN, J. **Propagation of gooseberry cultivars using softwood cuttings** [Množení odrůd angreštu pomocí bylinných řízků] p. 145-149

The objective of this study was to find the efficiency of perspective gooseberry cultivars propagation using softwood cuttings and comparing two stimulators. Fourteen gooseberry cultivars with difficult propagation by hardwood cuttings (7 red and 7 white cultivars) were observed in the trial. The propagation was carried out in the half of June at the propagation table with shading, automatic intermittent mist system and rooting substrate. Stimulators AS-1 and Racine were compared. A share of individuals suitable for planting was the evaluation criterion (amount and % of rooted individuals). The best results of rooting were found in red gooseberry cultivars 'Černý neguš', 'Hinnonmacki rot', 'Karát' and 'Pax', and white gooseberry cultivars 'Polonda', 'Darek' and 'Prima'. A share of rooted cuttings ranged from 25 to 52.5 % in the tested cultivars. The exceptions were two older cultivars 'Zlatý fík' and 'Citronový obří', in which the portions of rooted cuttings were only 2.5 and 5 %. The reason of low efficiency of rooting can be their higher susceptibility to fungal diseases compared with other tested cultivars. Comparison of two tested stimulators showed only a small differences in their effects. Only in case of two mentioned cultivars 'Zlatý fík' and 'Citronový obří', no cutting rooted using Racine stimulator.

Key words: gooseberry, cultivars, vegetative propagation, softwood cuttings

ČEJKA, B.; MATĚJÍČKOVÁ, J.; MATĚJÍČEK, A.; PAPERŠTEIN, F. **White currant cultivar 'Jantar'** [Odrůda bílého rybízu 'Jantar'] p. 83-86

Cultivar 'Jantar' was bred by crossing 'Vierlandenský II' x 'Heros' in Breeding Station Velké Losiny, Czech Republic. Growth is medium vigorous, bush shape is wider and globular. Shoots are stronger, firm, medium dense. Spurs are shorter and placed along whole length of branches. High amount of blossoms guarantees good yield also in unfavourable conditions. Blossoms do not suffer too much due to weather conditions. Leaves are firm, lighter colour, reddish by the scape. Clusters are medium length to long, sparser, with long peduncle. On average, the clusters consist of 14 medium-sized berries that ripen equally and not fall even when overripe. Cluster length is about 70 mm. Berries are light yellow colour with a low content of stones, very delicious, sweet-acidic taste and very good quality. Cultivar is particularly suitable for direct consumption as a table fruit, but also excels in high-yield of high-quality juice for technological processing. It is an early cultivar with good and regular yield that can be successfully harvested by mechanized harvest, without much damage and with minimal harvest losses. It can be well grown also as a tree form. Areas for commercial growing are the most suitable for plantings, but successful growing is possible also in marginal and foothill areas. Health of the cultivar is good, plants are not susceptible to leaf spot, but are attacked by currant aphid. Pruning requirements are medium. To achieve high yield and fruit quality requires regular replacement of fruiting wood. Cultivar 'Jantar' can be reliably propagated using hardwood cuttings.

Key words: white currant, cultivar, 'Jantar', description, evaluation

ČEJKA, B.; MATĚJÍČKOVÁ, J.; MATĚJÍČEK, A.; KAPLAN, J. Propagation of blackcurrant cultivars and hybrids of blackcurrant and gooseberry using hardwood cuttings [Množení odrůd černého rybízu a kříženců černého rybízu a angreštu pomocí dřevitých řízků] p. 139-143

The aim of this study was to find effective propagation method of perspective blackcurrant cultivars and hybrids of blackcurrant and gooseberry using hardwood cuttings. Twelve blackcurrant cultivars and two hybrids were observed. Two terms of propagation using hardwood cuttings were tested (autumn and spring term). The hardwood cuttings were planted in beds with irrigation. A share of individuals suitable for planting was the evaluation criterion. The results showed higher share of rooted cuttings in the autumn term of propagation compared to the spring term. A negative aspect of the autumn term of propagation can be possible lethal effect of winter frost on the cuttings of some sensitive cultivars in relation to weather conditions in winter season. Therefore both terms of propagation can be considered as suitable to apply. The best results of rooting were found in blackcurrant cultivars 'Lota', 'Ben Hope', 'Ben Conan' and hybrid cultivar 'Josta'.

Key words: blackcurrant, cultivars, hybrids, vegetative propagation, hardwood cuttings

CHROBOKOVÁ, E.; SUCHÁ, J.; LUDVÍKOVÁ, H.; KŘIVOHLÁVKOVÁ, L.; NOVÁKOVÁ, D.; J. FRÁNOVÁ, J.; M. NAVRÁTIL, M.; VÁLOVÁ, P. Monitoring of phytoplasma occurrence in fruit trees in the Czech Republic using molecular methods [Monitoring výskytu fytoplazem ovocných dřevin v ČR pomocí molekulárních metod] p. 219-232

During years 2009-2011 occurrence of Candidatus Phytoplasma mali, Ca. P. pyri and Ca. P. prunorum was monitored in the fruit tree orchards in the Czech Republic. The recently established orchards (one-year and two-year old) and the older orchards of apple, pear and apricot trees were investigated. The total of 882 apple samples, 145 pear samples and 176 apricot samples were collected. The shoots were collected from symptomatic and asymptomatic fruit trees. The total DNA extraction from phloem, stalks and roots of collected samples was performed according to Ahrens, Seemüller (1992). The phytoplasma detection was performed using direct-PCR (primer pair R16F2n/R2, Gundersen and Lee 1996, Lee et al. 1993), nested-PCR (primerů R16rU3/fU5, Lorenz et al. 1995) and RFLP (restriction enzymes RsaI a BfmI, Fermentas, Lithuania) methods. Within the apple samples collected from the older orchards there was found 61.1 % of positive samples of Ca. Phytoplasma mali in 2009 and 92.9 % of positive samples of Ca. P. mali in 2011. Within the pear samples collected from the younger pear orchards there was found 11.1 % of positive samples in 2011 and 15.2 % of positive samples in 2012. Within the apricot samples collected from older apricot orchards there was found 76.2 % of Ca. P. prunorum positive samples (trees) in 2011.

Key words: Candidatus Phytoplasma mali, Candidatus Phytoplasma pyri, Candidatus Phytoplasma prunorum, phytoplasma occurrence, PCR, RFLP

PAPRŠTEIN, F.; SEDLÁK, J.; MATĚJÍČEK, A.; CHROBOKOVÁ, E.; POLÁK, J. Evaluation of nontransgenic resistance sources of plum to PPV [Hodnocení netrtransgenních zdrojů rezistence slivoně vůči viru PPV] p. 213-218

Sharka caused by Plum pox virus (PPV) is considered to be the most important and destructive viral disease of plums, peaches, nectarines and apricots in Central Europe. The first reliable information about sharka on the territory of the Czech Republic originates from the thirties of the twentieth century. PPV is currently widespread almost on the whole territory. Most of the main plum growing areas are stricken by the disease. Growing of PPV resistant cultivars is basic possibility of protection. Therefore an experiment with evaluation of resistance of selected non-transgenic plum cultivars after artificial inoculation with PPV was established. Ten containerized plants of each cultivar in the experiment were artificially inoculated with two strains of PPV (5 plants with PPV - M and 5 plants with PPV - D) second year after planting. ELISA tests were carried out in years 2011 and 2012. Symptoms of PPV on leaves of 28 plum cultivars and myrobalan were visually evaluated during vegetations 2011 and 2012. PPV - M strain spread in the artificially infected cultivars faster than PPV - D strain. In the first year, PPV - M strain infected 43 % cultivars contrary to 34 % infection rate of PPV - D strain. After two years of testing, PPV - D strain of PPV was not proved in cultivars 'Durancie', 'Ortenaur', 'Reeves' 'Souffriau', 'Topfive', 'Toptaste' and 'Topstar plus' and PPV - M strain in cultivars 'Durancie', 'Topfirst', 'Topfive', 'Topking', 'Toptaste', and 'Valcean'. The most severe symptoms of PPV were proved on cultivars 'Toprend plus', 'Victoria' (distorted leaves) and 'Ersingerská', 'Valjevka' (distinct yellow ring spots scattered over all leaves). Observation of symptoms and testing of the PPV relative concentration by ELISA will continue in following years.

Key words: plum, sharka, cultivar, ELISA, symptoms

PIŠŤĚKOVÁ, I. Comparison of harvest and qualitative indicators at selected range of varieties of strawberry with the possibility of use in the system of organic production [Porovnání sklizňových a

kvalitativních ukazatelů u vybraného sortimentu jahodníku s možností využití v systému ekologické produkce jahod]p. 133-138

*Harvest parameters and incidence of fungal diseases were evaluated at 10 selected varieties of strawberry with the possibility of use in the system of organic production. The highest marketable yield was reached by varieties 'Induka', 'Elkat', 'Salut' and 'Lesana'. The lowest share of non-standard fruits of varieties showed 'Asia', 'Darselekt' and 'Queen', those varieties showed also the firmest fruits. Higher resistance against infection with *Botrytis cinerea* showed varieties 'Queen', 'Lesana' and 'Darselekt'. Varieties 'Elkat', 'Olivie' and 'Induka' showed higher resistance against infection with strawberry plant leaf blight (*Mycosphaerella fragariae*).*

Key words: strawberry, organic production of strawberries, varieties, harvest, pathogens

PIŠTĚKOVÁ, I.; MATĚJÍČEK, A. Quality parameters changes during ULO storage of apples [Změny kvalitativních parametrů během skladování jablek v ULO atmosféře] p. 117-120

The objective of this experiment was the observation of weight losses changes in selected apple cultivars 'Meteor', 'Golden Delicious', 'Idared' and 'Rubinola' stored in ULO conditions (ultra low oxygen). Total weight losses caused by fruit respiration and evaporation during storage period from October to June, measurements of soluble solids and penetration (flesh firmness) were observed. Differences in weight losses were found among all cultivars and ranged from 2.0 to 3.7 %. The lowest weight losses during the storage period were found in cultivars 'Idared' and 'Meteor', the highest in cultivars 'Rubinola' and 'Golden Delicious'. Values of soluble solids measurements slightly increased during storage in all observed cultivars except of 'Rubinola', where the values slightly decreased. Evaluated cultivars differed also in flesh firmness. The highest flesh firmness was found in cultivar 'Idared', followed by 'Meteor', 'Rubinola' and 'Golden Delicious'.

Key words: ULO, storage, weight losses, apples, penetration, refraction

PIŠTĚKOVÁ, I.; BLAŽEK, J. Results of evaluation long-term storage of fruits of selected plum cultivars in ULO atmosphere with using SmartFresh (1-MCP) technology [Výsledky hodnocení dlouhodobého skladování plodů slivoní v ULO atmosféře s použitím 26technologie SmartFresh (1-MCP)] p. 121-131

Fruits of five plum cultivars were stored at temperature 1.5 °C in two experimental variants in ULO atmosphere containing 2 % O₂ and 1 % CO₂. The main experimental variant (SF) of fruits was treated before of storing 24 hour application of SmartFresh 1-MCP (1-methylcyclopropen), that inhibits the production of ethylene. The control variant (C) was without this treatment. During of storing qualitative characteristics fruits were in week intervals assessed. The shortest time storage potential (4 weeks) had fruits of cultivar 'Hanita' that were harvested as early as on the August 17th. Other cultivars had storage life more than double longer. The fruits treated by SmartFresh had significantly higher content of refractometric solids and lower occurrence inner flesh decay. This influence was the highest near cultivars 'Tophit' and 'President'. This treatment prolonged fruit storage life in cultivar (compared of control) 'Hanita' by 3 weeks. In case of cultivars 'Haganta' and 'Tophit' was their storage life was prolonged by 2 weeks and in cultivars 'President' and 'Jojo' by one week.

Key words: plum, storage, senescence, fruit quality, storage potential, SmartFresh (1-MCP)

BLAŽEK, J. New summer apple cultivar 'Judita' [Nová letní odrůda jabloně 'Judita'] p. 63-65

This cultivar originated from crossing of 'Julia' x HL 1416 that was to done in RBIP in Holovousy in 1992. Pre-selected seedling for resistance to diseases was since 1997 evaluated in selection orchard under labelling HL 653. In the year 2004 it was applied for the State variety trials and registered in ČR in the year 2011. It is a medium precocious summer cultivar, possessing larger attractive fruits and a good inner quality. Trees grow rather vigorously, creating wide-spread canopies and being relatively resistant to diseases. Cropping is precocious, medium high and regular. Fruits are middle or above - average size having regular flatly globular shape. Skin is stronger, rather firm, smooth, and almost dry. Ground colour is creamy yellow, but up to 90 % used to be covered by red, largely washed over colour. Flesh is creamy yellow, crisp, medium firm and rather juicy. Taste is very good, acidulated sweet, pleasantly flavoured. Fruits harvests ripen in the late first decade August and are storable till the end of August. Cultivar 'Judita' is recommended both for the self - supply of producers and commercial growing on the rootstock M 9 like slender spindle in applying regular pruning.

Key words: apple, cultivar, 'Judita', description, evaluation

BLAŽEK, J. New apple cultivar 'Frosta' [Nová odrůda jabloně 'Frosta'] p. 59-61

This cultivar novelty originated from crossing of 'Florina' and A 814/9 ('Cox Orange pippin' x A 467-74), that was to done in RBIP in Holovousy in 1991. It is resistant to scab and only a very little suffers from powdery mildew. In addition it is fair resistant to canker and its fruits do not suffer form physiological disorders and rots. Its harvest maturity take place during middle of September and fruits are storable till late winter months. Trees grow slightly vigorously. They

create wide-spread and medium dense canopies. Tree productivity is precocious, pretty high and on the whole regular. Fruits are above average in size, firm and possess conic oval shape. Their ground colour is greenish yellow and from 50-75 % is overlaid crimson red over colour formed mainly by stripping and mottling. Fruit flesh that is creamy in colour, it is crisp, pretty firm and juicy. Its taste is very good, acidulated sweet, pleasantly flavoured. Cultivar 'Frosta' is presently recommended for commercial growing in warm and medium warm regions under using M 9 rootstock and slender spindle tree form. Regarding to its resistance to diseases should be primarily useful for growers applying ecological systems of this production.

Key words: apple, cultivar, 'Frosta', description, evaluation

BLAŽEK, J. Apple cultivar 'Fragrance' [Odrůda jabloně 'Fragrance'] p. 67-70

This cultivar originated from a cross 'Florina' x 'Jarka'. Trees are medium vigorous, growth habit is spreading, medium dense. They are precocious in bearing, yields are high and regular. The cultivar is resistant to scab; regarding mildew it is slightly to medium susceptible. Physiological and storage disorders practically do not occur. Fruits are nearly solid dark red (washed), medium to large size, with regular globose shape. Flesh is cream, fine, firm, medium juicy, rather sweet, pleasantly flavoured, excellent. Fruits are resistant to bruising and they do not fall prematurely before harvest. They should be picked at the same time like 'Golden Delicious'. They keep well in a normal cold storage till spring months. The cultivar is suitable for market used as fresh fruit targeted for consumers which prefer more sweet apples. It is recommended mainly for growing in medium warm regions, where can be grown without protection against scab. Regarding yields it can compete to the majority of hitherto cultivars with resistance to scab. In total it is an easy growing cultivar.

Key words: apple, cultivar, 'Fragrance', description, evaluation

BLAŽEK, J.; KŘELINOVÁ, J. Tree vigour and productivity within a set of progenies evaluated during an apple breeding program [Intenzita růstu a plodnost stromů v souboru potomstev hodnocených v rámci programu novošlechtění jabloní] p. 165-178

The subject of this evaluation was to 1182 genotypes preliminarily selected for resistance to scab, that originated from 17 crossbred progenies. These progenies were mutually significantly distinguished in their tree vigour. The mean value of trunk cross-section area of the weakest growing progeny correspond only to 38.4 % that values recorded at the progeny having the highest vigour. Similar differences among progenies were found out also on the basis of tree canopy volume. The vigour parameters assessed on basis of canopy volume were, however at several progenies somewhat different. The frequencies of vigour size groups within each single progeny usually corresponded to frequency distribution according to Gauss curve. The mean shoot length was strongly correlated to the size of trunk cross-section area. The progenies were mutually much distinguished by the mean age, when they reached their fertility. The age, when progenies reached their fertility stage, was further significantly influenced also by their tree vigour. In total set of assessed progenies there were further found very significant differences in their mean productivity and in productivity of the most or the least productive genotypes. No relationship was however found between productivity of the parents and fertility of their progenies.

Key words: tree vigour, juvenile phase duration, precocity, productivity, biennial fruiting

BLAŽEK, J.; J. KŘELINOVÁ, ŠECOVÁ, M. Selected characteristics of new apple cultivars and selections evaluated in the experimental orchard established in 2003 [Vybrané charakteristiky nových odrůd a novošlechtění jabloní hodnocených v pokusné výsadbě založené v roce 2003] p. 13-26

Results from long - term evaluation of 21 new cultivars and selections in dense experimental planting in RBIP Holovousy are presented using their comparison to the standard cultivar 'Golden Delicious'. Within this study resistance of 3 cultivars and other 5 genotypes against scab had been confirmed. On 3 other selections any symptoms possibly connected to powdery mildew wasn't recorded. In case of new cultivars significant differences in tree vigour were found, that should be respected at selection of suitable tree spacing during their planting into production orchards. The cultivars 'Spalord' and 'Starkresa' have been distinguished by their highest specific yields. On the contrary cultivars 'Frosta' and 'Judita' had this indicator of productivity the lowest ones. The duration of consumption maturity in the case of summer cultivar 'Judita' passed over since the end July till early September. On the contrary 'Rucla' cv. had the longest fruit shelf life durable at average till the end of June. The fruit storability of cultivars 'Starkresa' and 'Fragrance' was also very well. Cultivars 'Rucla' and 'Spalord' were the best ones regarding their fruit appearance and taste. From assessed selections the HL 617-11 was unambiguously the best one regarding its fruit quality and duration of shelf life. Some other assessed selections should be useful like donors of durable fruit storability in future programs of fruit breeding.

Key words: scab, mildew, tree vigour, yields, cropping efficiency, fruit quality, storage

BLAŽKOVÁ, J.; HLUŠIČKOVÁ, I. **New sweet cherry cultivar 'Christiana'** [Nová odrůda třešně 'Christiana'] p. 71-73

It is a bigarreau type sweet cherry ripening within 4th or 5th sweet cherry weeks. Its tree vigour is medium and tree habit is wide - branched. Fruit weight varied between 9 to 10 g. The mean fruit width is 27 mm. Fruit skin posse darkly red colour. Fruit stem length is medium one. The fruit stone is relatively small. Flesh has good, acidulated sweet taste and it is medium firm. Variety is heterogamous. It is quite resistant to damage of flowers by late spring frosts and somewhat sensitive to infestation by fungus Blumeriella jaapii. It is resistant to fruit cracking. Its tree productivity is precocious and very high.

Key words: sweet cherry, cultivar, 'Christiana', description, evaluation

BLAŽKOVÁ, J.; HLUŠIČKOVÁ, I. **New sweet cherry cultivar 'Irena'** [Nová odrůda třešně 'Irena'] p. 75-78

It is a bigarreau type sweet cherry. It ripens in the 6th cherry week. The tree has highly globular medium dense canopy. It is well spurred by fruiting spurs. Fruits are large, globular shape, in pistillary parts flat. Fruit weight varied between 9 and 10 g. Mean fruit width ranged around 27 mm. Fruit skin has darkly red colours. Fruit stem is very long. Stone is middle - sized. Flesh has red colours, is juicy, good taste, sweetly acidulated. Juice stains medium intensive. Flesh is firm. This variety is heterogamous. It is sensitive to flower damage by late spring frost and medium susceptible to Blumeriella jaapii rot. It is medium resistant to Monilinia rot and medium resistant to fruit cracking. It was successfully tested on rootstocks P-TU-2, P-HL-A, P-HL-C and Gisela 5.

Key words: sweet cherry, cultivar, 'Irena', description, evaluation

KAPLAN, J.; MATĚJÍČEK, A.; MATĚJÍČKOVÁ, J.; VESPALCOVÁ, M. **Elderberry cultivar 'Sambo'** [Odrůda černého bezu 'Sambo'] 91-94

Cultivar 'Sambo' was bred in Research Institute of fruit and ornamental woody plants in Bojnice as the first and at the same time the only one Czechoslovak cultivar. Growth is medium vigorous, rather upright, general habitus is semi spread. From the perspective of the flowering term, it is one of the earliest elderberry fruit cultivars. The cultivar can be successfully grown as bush or tree form. Height of unpruned bushes can reach 5 to 8 metres. Full fruitfulness begins from 3rd to 5th year after planting. The cultivar has a stronger tillering ability. Size of inflorescences is usually medium. Fragrance of flowers is one of the most typical, strong and aromatic. Infructescences achieve average weights. Weight of fruits as a share of total weight of infructescences is slightly lower (87.7 %) than in other cultivars. The cultivar does not excel in above average yields. Valuable are mainly low demands of the cultivar on site conditions. In terms of agricultural traits, the cultivar is suitable for fruits as well as flowers production. In particular, flowers are very well used for syrup production.

Key words: elderberry, cultivar, 'Sambo', description, evaluation

KAPLAN, J.; MATĚJÍČEK, A.; MATĚJÍČKOVÁ, J.; VESPALCOVÁ, M. **Elderberry cultivar 'Samdal'** [Odrůda černého bezu 'Samdal'] p. 95-98

Cultivar 'Samdal' originates from breeding programme, which was realized in 80th of 20th century in Denmark. Growth is rather vigorous and upright. The cultivar excels in extremely rapid beginning of fruitfulness. This cultivar can be successfully grown as bush or tree form. The tree form growing is more profitable per area unit compared to bush form. Inflorescences are usually medium to large, colour is creamy white, yellowish. Infructescences achieve high weights on the average. Flesh is dark red, juicy and has very good colourability. Surface of the fruit is shiny. Juice of the fruit is dark red, has very favourable content of acids, high pH and excellent taste. The cultivar has a valuable feature which is completely equal ripening of fruits in the infructescences. Ripening of all infructescences on the plant takes less than one week. It is a top cultivar which can be used especially for beverages production including wines and also for fruit jams production.

Key words: elderberry, cultivar, 'Samdal', description, evaluation

NÁMĚSTEK, J.; KOSINA, J.; MÉSZÁROS, M.; LAŇAR, L. **Effect of selected rootstocks on growth and yield of two plum cultivars** [Vliv vybraných podnoží na růst a výnos dvou odrůd slivoní] p. 189-196

Two selected cultivars 'Valjevka' and 'Cacanska najbolja' grafted on vegetative rootstocks Myrobalan SE 4043, Myrobalan SE 4044, Damascena SE 4045, MY-KL-A, GF 43, GF 655/2, GF 1869, Marunke SE 4034, Povazska okruhlicka, St. Julien A, Pixy, Myrobalan seedling and self-rooted plants of 'Cacanska najbolja' were planted in Holovousy in 1990. These experimental trees were evaluated according to following parameters: trunk cross-sectional area (cm²), yield (kg.tree⁻¹), yield efficiency (kg.cm⁻²) and suckering. The most intensive growth was recorded in the case of cultivar 'Valjevka' on rootstocks MY-KL-A, GF 43 and the poorest growth on rootstock GF 1869 and Pixy. Cultivar

'Cacanska najbolja' had the poorest growth on rootstock Pixy and the most intensive growth on Myrobalan seedling. The highest yield efficiency was achieved with cultivar 'Valjevka' on rootstock Myrobalan SE 4043. The lowest yield efficiency was with rootstock GF 43. The yield efficiency of 'Cacanska najbolja' was highest in the combination with rootstock Povazska okruhlicka and the lowest with the Myrobalan seedling. In the period 1992-2012, the total yield was highest with cultivar 'Cacanska najbolja' on rootstock Povazska okruhlicka and with cultivar 'Valjevka' on rootstock Myrobalan SE 4043. The largest number of suckers was produced by GF 655/2, GF 1869, Marunke SE 4034 and Damascena SE 4045 rootstocks in the case of both cultivars.

Key words: rootstock, growth, plum, yield efficiency, yield

NÁMĚSTEK, J.; PRAŽÁK, M.; MÉSZÁROS, M.; LAŇAR, L. **Different means of weed regulation and influence of weed within the rows on pome fruit yield** [Různé způsoby regulace plevelů a vliv zaplevelení příkmených pásů na výnos jádřovin] p. 197-203

Differences in yield (kg/tree) of apple cultivar 'Gloster' on M9 rootstock and pear cultivar 'Conference' on rootstock MA were evaluated in Holovousy in the period 2004-2012. Five experimental treatments were evaluated: control variant without herbicides and 50 %, 75 %, 90 % or 100 % within the tree row area treated by herbicides. An experimental variant, where 100 % of the area was treated by herbicides with cultivar 'Gloster' and 75 % of the area treated by herbicides with cultivar 'Conference' gave the highest yields. Control variant without herbicides gave the lowest yield in the case of both 'Conference' and 'Gloster'. Separate experiment with 'Idared' on M9 rootstock studied influence of different means of weed regulation on yield between years 2004–2010. There were 5 variants in this experiment: 1) control without herbicides, 2) herbicide application 2x per year, 3) herbicide application 1x in spring + mowing of weeds, 4) 2x application of herbicides with system CDA (Controlled Droplet Application) and 5) bark mulch. The highest yield were achieved in the treatment with herbicides 2x per year. In contrast, the lowest yield had control without herbicide application.

Key words: herbicide, weed control, yield, pear, apple

SEDLÁK, J.; PAPRŠTEIN, F. **In vitro propagation of cranberry (Vaccinium oxycoccus L.)** [In vitro množení klikvy (Vaccinium oxycoccus L.)] p. 151-156

The aim of this work was research of fast in vitro multiplication of European cranberry. McCown woody plant medium (WPM), Anderson's medium and half-strength Murashige and Skoog medium (half-MS) containing cytokinin zeatin in concentrations 0.5, 1 or 2 mg · l⁻¹ were tested for in vitro cultivation. The highest multiplication rate 8.8 ± 0.3 was noted on Anderson medium with zeatin (2 mg · l⁻¹). The lowest multiplication rate (1.7 ± 0.1) was noted on WPM medium. At the end of one month subculture period, spontaneous root induction on the base of all explants occurred on all three multiplication media.

Key words: multiplication, explant, shoot, medium, rooting

SEDLÁK, J.; PAPRŠTEIN, F. **Micropropagation of edible honeysuckle** [Mikropropagace zimolezu kamčatského] p. 157-163

The aim of this work was research of micropropagation of edible honeysuckle (Lonicera kamtschatica (Sevast.) Pojark) with bigger fruits. Two shoot tips were successfully established in vitro using sterilization by HgCl₂. Eight proliferation MS media containing 1, 2 and 4 mg · l⁻¹ kinetin; 1, 2 and 4 mg · l⁻¹ BAP or 0.5 and 1 mg · l⁻¹ TDZ (thidiazuron) were tested for research of initiation of multiplication. The highest multiplication rate 12.8 ± 1.6 was obtained on MS medium containing 1 mg · l⁻¹ TDZ. Multiplication rate varied between 1.6 and 2.4 on MS medium supplemented with BAP. The root induction was satisfactory from 40 to 86 % of in vitro rooted plants. On an average, NAA promoted rooting of more plants in 50% MS medium than IAA and IBA.

Key words: Lonicera, explant, shoot, medium, rooting

SEDLÁK, J.; PAPRŠTEIN, F.; SVOBODOVÁ, L.; TALÁCKO, L. **In vitro thermotherapy and chemotherapy of apple cultivar 'Jarka'** [In vitro termoterapie a chemoterapie odrůdy jabloně Jarka] p. 233-240

Apple cultivar 'Jarka' was selected for application of in vitro thermotherapy at 34 or 38 °C and chemotherapy on medium with 20 mg · l⁻¹ of antivirotikum ribavirin. The presence of viruses in selected initial tree was detected by ELISA and RT-PCR testing before the beginning of sanitation procedures. Cultivar 'Jarka' was infected with Apple chlorotic leaf spot virus (ACLSV) and with Apple stem pitting virus (ASPV). 'Jarka' was successfully multiplied in in vitro cultures. Multiplication coefficient was 2.3 ± 0.1 for 'Jarka' after four weeks of cultivation on MS medium with 1.5 mg · l⁻¹ BAP. In the course of thermotherapy at 38 °C, the apical part of in vitro plants withered by the 5th day and viable shoots tips could not be taken. The heat treatment (34 °C) and chemotherapy (ribavirin 20 mg · l⁻¹) were applied to the in vitro

cultures on the same MS medium as for multiplication for the period of 30 days. After a culture period of 30 days, the apical part of the axis (about 3 mm in length comprising the apical meristem plus two-three primordial leaves) was dissected under a laminar flow hood and transferred to a fresh multiplication MS medium with $1.5 \text{ mg} \cdot \text{l}^{-1}$ BAP for regeneration. Twenty *in vitro* explants were taken in each treatment. After the end of chemotherapy and after repeated testing, 11 (55 %) clones of apple cultivar 'Jarka' were free of viruses discovered in initial plant. In contrary, only 1 (5 %) clone of 'Jarka' was virus-free after chemotherapy at 34 °C. Obtained results demonstrate the effectiveness of the system of virus elimination by a combination of *in vitro* cultures, chemotherapy with ribavirin and subsequent removing of apical meristematic region. Relatively high percentage of obtained virus free plants confirms high antiviral activity of ribavirin against ASPV and ACLSV.

Key words: explant, ribavirin, shoot, virus, medium

KLOUTVOROVÁ, J.; KNĚZÁČEK, L.; KUPKOVÁ, J.; NÁMĚSTEK, J. **Evaluation of efficacy of ten preparations against grey mould on strawberry** [Hodnocení účinnosti deseti přípravků proti šedé hnilobě jahod] p. 249-256

Efficacy of ten commercial preparations against strawberry grey mould caused by Botrytis cinerea was evaluated in field small-plot trials. Foliar sprays of preparations were applied repeatedly from bloom to harvest. The occurrence of the rot caused by grey mould was evaluated on the fruits during harvest. The best results (the lowest damage) were achieved with fungicides Teldor 500 SC and Mythos 30 SC. Efficacy of treatment by fungicides Ortiva, Signum and Switch was very good as well, while efficacy of HF-Mycol, Myco-Sin Vin and Polyversum was significantly lower.

Key words: strawberry, Botrytis cinerea, grey mould, control, fungicides

MÉSZÁROS, M.; KOSINA, J.; LAŇAR, L.; NÁMĚSTEK, J. **Evaluation of growing characteristics of four pear cultivars on selected rootstocks** [Hodnocení pěstitelských vlastností čtyř odrůd hrušni na vybraných podnožích] p. 179-188

The influence of eight rootstocks on the growth and yield was observed in pear plantations with cultivars 'Max Red Bartlett', 'Conference', 'Lucas' and 'Grosdemange'. Rootstocks MA, MC, Provánská, BA-29, Sydo, Adams, Ostřešanská and pear seedling were used in the trial. The plantations were evaluated in Research and breeding institute of pomology Holovousy Ltd. (the Czech Republic) in years 1992-2011. Yield efficiency, trunk cross-section area and suckering were evaluated. The highest yield with cultivar 'Max Red Bartlett' was observed on the pear seedling, BA 29 and Sydo. Cultivar 'Conference' was most productive on rootstocks Sydo, MA and pear seedling, but the influence of rootstocks was not statistically significant. Concerning cultivar 'Lucas', the most productive combination was with Provánská rootstock, but the influence of rootstocks was not significant. The highest yield with cultivar 'Grosdemange' was on Sydo rootstock. The highest growth vigour in all combinations was on pear seedling. The lowest growth vigour of cultivars 'Max Red Bartlett' and 'Conference' was on MC rootstock. Cultivars 'Lucas' and 'Grosdemange' had the lowest growth vigour on MC and Adams rootstocks. The most suckering rootstocks were Ostřešanská for cultivars 'Max Red Bartlett' and 'Lucas', pear seedling for cultivar 'Conference', and Adams for cultivar 'Grosdemange'. The best results of yield efficiency were observed with 'Max Red Bartlett' on rootstocks Sydo, Provánská, BA 29 and MA. Cultivar 'Conference' had the best results of yield efficiency on the rootstock MC. Cultivar 'Lucas' had the highest yield efficiency on MC, Provánská, Sydo and Adams rootstocks. With cultivar 'Grosdemange' the best yield efficiency was observed on rootstock MC.

Key words: pear, rootstock, growth vigour, yield, suckering

VESPALCOVÁ, M.; CETKOVSKÁ, J.; MATĚJÍČEK, A.; KAPLAN, J. **Nutritional parameters of elderberries** [Nutriční parametry bezinek] p. 37-45

Fruits of elderberry are an important food resource. They are valuable for their content of biologically active substances and in particular as a natural food colorant. Within two years, the survey of selected nutritional parameters relevant to the use of elderberries was carried out. Parameters of juice yield, titratable acidity, reducing amount of carbohydrates, contents of anthocyanins and routine were observed. According to these parameters, variety 'Haschberg' provided in the Czech Republic conditions some of the best results in four of the five evaluated parameters. This variety provided relatively high juice yield ($640.0 \text{ ml} \cdot \text{kg}^{-1}$) and the second highest amount of routine ($6.42 \text{ g} \cdot \text{kg}^{-1}$). The ratio of titratable acids (25.7 and $24.0 \text{ g} \cdot \text{l}^{-1}$) and sugars ($6.76 \text{ g} \cdot 100 \text{ g}^{-1}$) was very favourable in terms of the resulting taste. 'Sambu', 'Samdal', 'Samil', 'Sampo', 'Heidegg 13', 'Pregarten', 'Sambo' and 'Aurea' were evaluated as other valuable varieties.

Key words: elderberry juice, titratable acids, reducing sugars, anthocyanins, rutin

VÁVRA, R.; SKŘIVANOVÁ, A.; BLAŽKOVÁ, J.; KRŠKA, B. **Resistance evaluation of apricot genotypes to brown fruit rots caused by fungi *Monilinia* spp. in the year 2012** [Hodnocení odolnosti genotypů meruněk k hnílobám plodů způsobené houbami rodu *Monilinia* v roce 2012] p. 241-248

*The objective of this study was evaluation of apricot genotypes (cultivars and hybrids) resistance to brown fruit rot during storage causing by fungi from *Monilinia* species (*Monilinia fructigena* and *Monilinia laxa*). Totally 21 samples of apricot genotypes were evaluated in the year 2012. As the most resistant to brown fruit rots were evaluated cultivars 'Harlayne', 'Veharda', 'Bergeron' and 'Darina' without any damage after one week of storage in conditions of artificial inoculation. In contrary, fruits of cultivar 'Hargrand' and hybrids 2/38 OPF x Harcot, Sundrop x Harcot and Harlayne x Harcot (sample III) were damaged by monilinia rots after two weeks of storage. On fruits of cultivars 'Harogem' (sample II), 'Veharda', 'Bergeron', 'Harlayne' and hybrid Harlayne x Harcot (sample III) was not observed rot damage in first three weeks of evaluation in conditions of natural infections. The most severe fruit damage after natural infections was recorded on cultivar 'Darina' and hybrid 2/34 x NJA 1A that were discarded from next evaluation after two weeks of storage. Finally as the most resistant to brown fruit rots were evaluated cultivars 'Harlayne', 'Sundrop', 'Veharda' and 'Veecot' in conditions of artificial inoculations and cultivars 'Harogem', 'Harlayne', 'Bergeron' and 'Veharda' in conditions of natural infections in orchards.*

*Key words: *Monilinia laxa*, *Monilinia fructigena*, brown fruit rot, *Monilinia* spp., artificial inoculation, resistance*

VÁVRA, R.; BLAŽEK, J.; VEJL, P. **Tree growth evaluation of chosen apple columnar genotypes** [Hodnocení růstu stromů u vybraných sloupcových genotypů jabloní] p. 47-57

The objective of this study was evaluation of chosen apple columnar tree growth genotypes in the experimental plot. Columnar tree growth habit was discovered in the sixties of 20th century and described as 'McIntosh Wijcik' (Fisher 1970). The central tree axis with short fruiting spurs is characteristic feature of genotypes with this growth habit. The cultivars mutually differ in tree vigour, spurring density and length of fruiting spurs. Those characteristics were evaluated from the year 2008 to 2012 on 55 apple genotypes with columnar tree habit, totally on 208 trees on the M.9 rootstock. Annual internodes growth of the central tree axis varied from 11.4 cm to 43.5 cm with mean length 23.2 cm. Tree height after six years of growing varied from 1.06 m to 3.39 m with mean height 1.75 m. The length of axis fruiting spurs on three years old wood was usually between 10 cm to 15 cm. 20 genotypes was evaluated with length up to 10 cm and only one genotype had the length higher than 15 cm. The spacing between fruiting spures on three old part of the central axis was recorded from 2.1 cm to 6.3 cm with mean value 3.1 cm.

Key words: Columnar tree growth habit, McIntosh Wijcik, apple columnar genotypes

LITSCHMANN, T.; VÁVRA, R.; FALTA, V. **Non-destructive leaf area assessment of chosen apple cultivars** [Nedestruktivní stanovení listové plochy vybraných odrůd jabloní] p. 205-212

The method enabling assessment of leaf area by non-destructive way based on leaves length (L) and width (W) measurement is described in the present work. By analysis of 200 leaves of four apple cultivars was ascertained that the best result is possible to obtain if the product of leaf length and width (LxW) is afterwards multiply by coefficient 0.71 no depending on cultivar. Mean bias error (MBE) of obtained results ranges up to 2.1% from really measured area, root mean square error (RMSE) range from 5.9% to 6.4%. This technique is possible with advantage use in cases when the continuous assessment of leaf area increases is directly on trees required and by reason of low demands on the instrument equipment is possible to perform this assessment on several locations simultaneously.

Key words: leaf area, area measurement, leaf area increases, non-destructive assessment, apples

PAPRŠTEIN, F.; SEDLÁK, J. **Evaluation of regional assortment of apple with regard to fungal diseases** [Hodnocení krajového sortimentu jabloně na houbové choroby] p. 257-262

*Evaluation of resistance to powdery mildew *Podosphaera leucotricha* (Ell. et Ev.) Salmon on annual shoots and apple scab *Venturia inaequalis* (Cke.) Wint on leaves was carried out according to 9-point descriptor. Evaluation was made in 3 years without chemical plant protection. Older cultivars, which were grown on the territory of the Czech Republic and repeatedly found during collecting missions, were evaluated. The landrace 'Žďárské úrodné' demonstrated the highest resistance against scab (7.1). Cultivars 'Zvonkové' (6.8), 'Chodské' (6.4) and 'Řehtáč soudkovitý' (6.1) followed. On contrary, the lowest resistance (2.8) was noted with cultivars 'Sudetská reneta' and 'Malinové hornokrajské'. Cultivars 'Čistecké lahůdkové' and 'Banánové zimní' were also evaluated as susceptible to apple scab. The highest resistance to powdery mildew was noted in the case of cultivar 'Hetlina'. Cultivars 'Chodské' and 'Baumannova reneta' were also evaluated as resistant to powdery mildew. On contrary, the lowest resistance (3.4) was noted in the case of cultivar 'Boikovo'. Cultivars important from the point of view of resistance to evaluated fungal pathogens are described at the end of this paper.*

*Key words: *Malus*, genotype, evaluation, susceptibility, *Venturia inaequalis*, *Podosphaera leucotricha**