Experiences with Different Cherry Rootstocks in Belgium

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Abstract

In modern cherry culture there is no longer a place for very tall trees. As was the case for apple and pear, the demand for smaller trees, that are easier to control, increased at the end of the seventies and the beginning of the eighties. In order to achieve this objective a search for dwarfing rootstocks began many years ago at different research and development stations. By analogy with M9 for apple, the objective with sweet cherries is to find a dwarfing rootstock that makes it possible to obtain trees with yield precociously and which are of reduced stature, so facilitating the harvest of all of the cherries when standing on the ground. In Belgium this research led to the introduction of the GM-rootstocks (Grand-Manil) and in Germany the first Gisela - (Giessen) and Weiroot-rootstocks came into existence. Gisela 5 is a rootstock with moderate to weak vigour. The yield efficiency of Gisela 5 is very high, with very good fruit sizes overall. In dry circumstances cherries can sometimes remain too small. Gisela 5 is suitable for most modern varieties. The original aim, a smaller easier to control tree, has been achieved with Gisela 5. The trees come into production earlier, which should shorten the time needed to reach breakeven on the orchard investment. It is also easier to intensify. The recommended planting distance is 4 x 2m. The trees reach a height of 3 to 4 meters, which makes the use of bird nets and/or plastic covering possible. Gisela 5 remains in most cases the best choice. Yet there are some situations in which a weaker or stronger growing rootstock is needed. Gisela3 grows less than Gisela5. When one thinks of covering the trees against cracking this rootstock can provide an alternative to Gisela5. Shorter pruning and a slightly higher fertilization combined with irrigation can probably bring the fruit size at the level of Gisela 5. Furthermore, it also seems appropriate to plant the trees on Gisela3 shorter (1.5 to 1.75m in the row instead of 2m), so that one is forced to prune shorter. Gisela6 emerges as a rootstock some what more vigorous than Gisela5. When one thinks of covering the trees against cracking this rootstock can provide an alternative to Gisela5. Shorter pruning and a slightly higher fertilization combined with irrigation can probably bring the fruit size at the level of Gisela 5. Furthermore, it also seems appropriate to plant the trees on Gisela3 shorter (1.5 to 1.75m in the row instead of 2m), so that one is forced to prune shorter. Gisela6 emerges as a rootstock some what more vigorous than Gisela5. This can be interesting on light soils or for (too)productive self-fertile varieties, although the latter until now does not appear fromour trials. One should in any casepay more attention to the fruit size, which some times remains too small. There are also fewer trees per hectare needed because the stronger growth strength is better to plant slightly wider (5 x 3m to 4x 2 m), depending on the soil type. Other rootstocks in trial are PiKu 4.20 (PiKu 1), Krymsk 5, Gisela 12, Gisela 148/13 (Gisela 13), Weiroot 720, WeiGi 1 and WeiGi 2.

New dwarfing and semi-dwarfing rootstocks tested in France

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Abstract

French growers use to plant vase training system with vigorous rootstocks like Sainte-Lucie 64, or semi-dwarfing like Maxma® 14. But vase training system and vigorous trees induce long time before first fruiting year and do not allow rain covering or insect-proof nets installation. Single axe or double-axe are better adapted, and for these kind of training system, dwarfing or semi-dwarfing rootstock are needed. In the past 10 years, only Tabel® Edabriz could be used, but this rootstock doesn’t work in every conditions. Different dwarfing and semi-dwarfing rootstock have been tested in France since years in the Ctifl/research stations network, and some of them are now (or soon) available for growers : Furtos (an hungarian sour cherry tested as rootstock since 1991), Weïroot 158 (german rootstock observed in France since 1995), Ceravium® PHL-A (czech rootstock observed in France since 1996), and Gisela 6 (german rootstock observed in France since 1999).

In 2007, these four rootstocks have been planted in comparison in eleven plots in France, in which three observed by La Tapy. Seven years after the plantation, it’s time to assess their performances :

- Furtos always has healthy foliage, whatever the conditions. It is interesting to use it to dwarf trees in low-fertility soil. But in good soil, the same vigour than Maxma® 14 is observed.
- With Weïroot 158, results depend on the plot. In fertile soil, a very good comportment has been noted, with good production and good size of fruits. But a lot of mortality has been observed in a plot observed by La Tapy, probably because of his high sensitivity to root asphyxia. In an other plot of the french network, sensibility to Mediterranean pine vole has been observed.
- Ceravium® PHL-A can be a good alternative in mid-fertility soil, better adapted than Gisela 6.
- Gisela 6 is a very productive rootstock, and it can have an negative impact on the size of the fruit. Moreover, the foliage can be unhealthy, especially in poor soil. But it can be as fast as Tabel® Edabriz to have the first fruiting.

Most of the time, results are very different depending on the plot. With dwarfing rootstocks, weather and soil conditions are very important, and it’s necessary to take care of it before to choose some of them.

Network coordinated by the Ctifl and including several research stations in which La Tapy
The 25-years history and overview of Polish clonal sweet cherry rootstock experiments

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Key words: sweet cherry, rootstock, growth, yield, productivity, fruit quality, incompatibility

Abstract
Since then the fruit tree is composed of rootstock and scion, the rootstock is an important part of the orchard and whole fruit production technology. So, the same fruit grower’s attention should be paid both to the rootstock and cultivar choose. For a long time the majority of rootstocks used for sweet cherry trees around the world were propagated by generative mean only. Above all, seedling rootstocks derived from seed of P. avium (L.) and P. mahaleb (L.) wild trees as well as selected genotypes were and are widely use for sweet cherry tree production. However, trees budded onto them are usually vigorous, come late into bearing and have low productivity. Investigations on different vegetatively propagated rootstocks performance in nursery, orchard as well as in greenhouse experiments began in Poland in 1988. During last 25 years rootstocks: F 12/1, Colt, P-HL A (84), P-HL B (224), P-HL C (6), Gisela 3 (209/1), Gisela 5 (148/2), Gisela 6 (148/1), PiKu 1 (4.20), PiKu 3 (4.83), PiKu 4 (4.22), Weirout 72, Weirout 158, Tabel Edabriz, Maxma Delbard 14 Brokforest (Maxma 14), LC-52 (Krymsk 6), VSL-1 and Victor have been testing. On the base of study, controlling sweet cherry tree vigour with P-HL A, P-HL B, P-HL C, Gisela 3, Gisela 5, Gisela 6, PiKu 1, PiKu 4, Weirout 72, Weirout 158, Tabel Edabriz, LC-52, VSL-1 and Victor rootstocks, in comparison with F 12/1, is very effective. Gisela 3 and Tabel Edabriz produce the most dwarfing trees. F 12/1, Colt, PiKu 3 and Maxma 14 performed as full-size rootstocks. A recent study conducted in Polish agronomic conditions found that including all important for fruit growers attributes of rootstocks (tree size, precocity, productivity, fruit quality, compatibility, root suckers, anchorage) Gisela 5, Gisela 6, P-HL A and PiKu 4 are the most useful to plant high-density sweet cherry orchards.

Performance of the sweet cherry cultivar 'Lapins' on 27 rootstocks growing in a Northern climate

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Key words: Prunus avium L., rootstocks, vigour, productivity, yield efficiency

Abstract
The performance of 26 different cherry rootstocks (‘Hexaploid Colt’, ‘Damil’, ‘Tabel® Edabriz’, ‘Gisela® (Gi) 3’, ‘4’, ‘5’, ‘6’, ‘7’, ‘11’, ‘Giessen (GI) 107/1’, ‘148/13’, ‘154/7’, ‘195/20’, ‘318/17’, ‘497/8’, ‘523/02’, ‘Weirout (W) 10’, ‘53’, ‘158’, ‘Maxma 14’, ‘Maxma 60’, ‘Maxma 97’, ‘PHL-A’, ‘PHL-B’, ‘Piku®1 and Piku® 3’), compared with ‘Colt’ as a standard, for the cultivar Lapins (Prunus avium L.), was assessed in a field trial in western Norway at 60 North. Trees, one-year-old whips, were planted in spring 1999; at 2.0 x 4.5 m spacing and trained to central leader as free spindle. Tree vigour, yield, fruit size, fruit quality and yield efficiency were evaluated for eight subsequent years. Tree sizes were significantly affected by the rootstocks after eight years growth. Tabel®Edabriz, ‘Gi3’ and ‘Gi4’ produced the smallest and ‘Piku®3’, ‘Colt’, ‘Damil’ and ‘Maxma 60’ the largest trees as measured by trunk cross-sectional area (TCSA). The most vigourus rootstock had five times larger TCSA than the dwarfest rootstocks. Piku®1 was the most productive rootstock for this cultivar with highest cumulative yield followed by ‘Colt’, ‘Piku®3’ and ‘Gi 523/02’. Average yield per tree and year during the first seven cropping years was 12 kg for ‘Piku®1’. ‘Piku®1’ and ‘Gi 5’ induced early bearing. Trees on ‘Gi 5’ and ‘Gi 6’were the most yield efficient. Fruit size became significantly affected by the different rootstocks. In average for the different cropping years many of the Gi number selections, ‘Colt’, ‘Damil’ and ‘Piku®1’all had an average fruit weight larger than 10 g per fruit. Fruit quality characterized by the content of soluble solids was in an average of 17.5 %. It was not influenced by crop load and did not differ much between trees on the various rootstocks. In conclusion, for high density production systems the most productive semi-vigorous rootstocks were ‘Colt’, ‘Piku®3’ and ‘Damil’ and the semi-dwarf ‘Piku®1’, ‘Gi5’ and ‘Gi 6’.
Preliminary results of some early ripening sweet cherry cultivars on some Hungarian bred Mahaleb rootstocks

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Key words: sweet cherry, rootstock, growth, yield, fruit size

Abstract

Evaluation of ten cherry rootstocks (‘Bogdány’, Cerasus mahaleb ‘Cemany’, ‘Egervár’, ‘Érdi V’, ‘Korponay’, ‘Magyar’, ‘SM 11/4’, Vadszorhesznye C. 2493’, ‘GiSelA 6’, control: INRA SL 64) rootstock) combined with early ripening sweet cherry cultivars (Petrus℗, Vera℗, Carmen℗) has been studied among non-irrigated conditions in Central Hungary. The trial was set up at Experimental Fields of NARIC Fruitculture Research Institute at Research Station of Érd. Aim of our study was to find suitable rootstock(s) for novel bred Hungarian sweet cherry varieties.

It can be stated after four years investigation that ‘Petrus’ was the most vigorous varieties, which is followed by ‘Vera’ and ‘Carmen’. The ‘GiSelA 6’ rootstock had low vigor among examined rootstocks and ‘INRA SL 64’ was the most vigorous one in our trial.

TCSA of ‘Petrus’ combinations grafted on ‘SM11/4’ and ‘Bogdány’ was significantly bigger than on ‘C. 2493’, ‘Egervár’ and ‘GiSelA 6’ rootstocks. Other rootstocks such as ‘Érdi V’, ‘Korponay’, ‘Magyar’ and ‘Cemany’ indicated high – moderate high vigor for ‘Petrus’.

‘GiSelA 6’/‘Vera’ combination had significantly smaller TCSA compared to other ‘Vera’ combinations. In the case of ‘Carmen’ rootstock ‘Cemany’ showed high, ‘Érdi V’, ‘C. 2493’, ‘Egervár’, ‘Korponay’ indicated medium and ‘GiSelA 6’ produced low vigor.

‘Petrus’ produced the biggest yield and the smallest fruit size among observed cherry varieties. Yield of ‘Carmen’ rootstock ‘Cemany’ showed high, ‘Érdi V’, ‘C. 2493’, ‘Egervár’, ‘Korponay’ indicated medium and ‘GiSelA 6’ produced low yield. ‘Petrus’ produced the biggest yield and the smallest fruit size among observed cherry varieties. Yield of ‘Carmen’ grafted on ‘Érdi V’, ‘Egervár’, and ‘GiSelA 6’ was the highest but only ‘Érdi V’ had a positive effect on fruit size because more than 40% of examined fruits were larger than 28,1 mm in diameter. ‘Vera’ yielded well on ‘Érdi V’ and ‘Egervár’, the best fruit size was produced by ‘Érdi V’.

On the basis of value –yield index, which was calculated by actual market price per fruit size category, ‘Carmen’ produced the highest income per tree on ‘Egervár’ and ‘GiSelA 6’ and ‘Vera’ was the most valuable on ‘Egervár’, INRA SL 64’, and ‘Érdi V’ rootstocks.

Cherry Rootstock Trials in Slovenia

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Key words: sweet cherry, rootstocks, vigour, productivity, yield efficiency

Abstract

The most used cherry rootstock in Slovenia is still Mazard (P. avium). In the last two decades some experiences with several rootstocks were obtained as well. Slovenia has been a part of Alpe Adria cherry rootstock trials from 1997 till 2013. In this period many rootstocks were tested. In the first trial (1997–2005) cv. Lapins on rootstocks Gisela 4, Gisela 5, Gisela 195/20, Weiroot 72, Weiroot 158, Weiroot 13, Tabel Edabriz, MaxMa 14 and Piku 1 were compared with F 12/1. The highest cumulative yield was obtained with Piku 1 and yield efficiency with Gisela 5. Tabel Edabriz negatively influenced fruit size. High tree mortality on Gisela 4 was examined. In the second trial (2006–2013) the effect of rootstocks Gisela 5, Gisela 6, Piku 1, Weiroot 158 and PHL-C on vigour and productivity of cultivars Kordia and Regina were observed in two locations, in the western and eastern part of Slovenia. Trees on Gisela 6 were the most and on PHL-C the least productive. There were no significant differences among Piku 1, Gisela 5 and Weiroot 158 in an average yield/tree. In the third trial (2006–2013) cv. Regina on Gisela 3, Weiroot 72 and Gisela 5 were planted in three different plant distances 1.5 m, 2.0 m and 2.5 m between trees in two locations, in the western and eastern part of Slovenia. The results of eight year-trial show that location, rootstock and plant distance significantly affected growth, productivity and fruit weight of Regina sweet cherry.
Review of Cherry Rootstock Research in Croatia

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Key words: sweet cherry, sour cherry, rootstocks

Abstract

Croatia has two main climatic regions: continental and Adriatic (Mediterranean). These two regions significantly differ in agricological conditions, soil type and systems of agricultural production. However, sweet and sour cherries are present in both regions, but it ripens more early in southern Adriatic parts of Dalmatia. Although the production might be commercially lucrative, the quantity of production is still moderate and does not occupy significantly big area. The majority of the production is still based on "wild" Prunus avium seedlings or Mazzard F12 in continental region, or non-selected Prunus mahaleb seedlings in Adriatic region. Consequently, the research on cherry rootstocks is still limited, although the improvement of the production technology highly depends on new technological achievements in breeding or introduction of new rootstocks. Considering vegetative rootstocks, several recent researches revealed that Giesela-5 or Weiroot 13 might be appropriate alternative to Mazzard, while in Adriatic region good results on the terms of fruit growth and yield were achieved on P. mahaleb SL-64. The improvement of nursery production can be achieved by micropropagation of rootstocks, but the transplantation stress might be a drawback. The use of mycorrhizal fungi in nursery production shown potential to decrease the stress caused by plant transplantation to conditions that are not sterile. The review of these researches will be shown here.

Sweet cherry rootstocks for Region of Murcia

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Abstract

Phenotypical expression of fruit cultivars is strongly linked with rootstock adaptability to soil and climatic conditions. In case of sweet cherry cultivars, for it to be cultivated with success in Region of Murcia, it is convenient to use rootstocks well adapted to particular clayed and limestone soils, present in most areas of this hot Mediterranean Region. In this particular soil and climatic conditions, traditional sweet cherry rootstocks, as Prunus mahaleb selections, usually death few years after plantation because of root asphyxia. For the same reason, didn't perform either well in Murcia other rootstock selections as CAB, MaxMa and Prunus cerasus, as well as other dwarfing selections of more recent introduction.

For finding a solution to prior soil troubles in sweet cherry, it was thought the convenience of using the rootstocks that support with success other stone fruit trees crops in Murcia, as occurs with peach and plum orchards. But to do that, before was necessary to avoid compatibility problems. The solution to that came by using Prunus cerasifera cv. Adara as interstock between sweet cherry cultivars and rootstocks usually used in peach and plum orchards. Like that, it had been possible to grow sweet cherry cultivars on Mariana 2624 (P. cerasifera x P. munsoniana), as well as the hybrid peach x almond cv. Mayor. The interstock Adara also allowed to grow sweet cherry cultivars on peach x almond GxN 9, GxN 15 and GxN 22 rootstock selections.

In order to evaluate these rootstocks for sweet cherry production it were settled in 2006 two trials placed in Jumilla, Murcia, with the cultivar Newstar. One of them included Mariana 2624 and Mayor with Adara as interstock, besides to Adara, MaxMa 14, as well as INRA SL 64 as control. The other one, held other rootstocks less vigorous, such as Gisela 5, PiKu 4, PiKu 3, with INRA SL64 and MaxMa 14 as controls. Data about vigour, production and fruit characteristics between the years 2010 to 2013 were recorded on both trials.

The results obtained showed that, in the Jumilla’s conditions, Gisela 5 reduced too much the size of trees and its use is nor acceptable. However, the most vigorous rootstocks, performed better. So, Mariana 2624, Mayor and Adara were the most productive, although the best fruit quality was reached on PiKu 3 rootstock, which induced the highest values of weight, caliper, sugar and fruit firmness. The rootstock selections Gisela 6, PiKu 1, SL 64 and Mayor showed a high rate of death during the first years after plantation due to their bad behaviour on heavy soil. However, even though the high rate of death recorded for the hybrid Mayor, peach x almond hybrids selections look like an important alternative for sweet cherry production on stony limestone soils, well aerated.
Cherry Rootstock Trials in Turkey: A Journey from Generative to Vegetative Rootstocks

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Key words: sweet and sourcherry, rootstocks,

Abstract
Primary sweet cherry rootstocks used in Turkey is still wild Prunus avium seedlings with approximately 25-30% ratio and followed by wild Prunus mahaleb seedlings with 15-20% ratio. The rest of the rootstocks are belongs to vegetative rootstocks mostly including Gisela5, Gisela6 and MaxMa 14. The other vegetative rootstocks used in sweet cherry production in Turkey are SL 64, Weiroot, Tabel Edabriz, P-HL, CAB and F 12/1. Between 1997-2007 Gisela series spreaded quickly throughout Turkey but later years most of the sweet cherry orchards grafted on Gisela rootstocks in particular inner and eastern Anatolia region rooted-out due to management, irrigation and nutrition problems. After that, most of the growers again turn to generative mahaleb and mazzard rootstocks in Turkey. Turkey has nine different agroclimatic regions and each regions has its characteristics soil properties. Mazzard rootstocks have been using in heavy soils and mahaleb rootstocks have been using in calcereous soils in Turkey among sweet cherry growers in Turkey. Among the mahaleb seedling rootstocks, the genotypes that has yellow-fruits and light trunk colors has been preferring because it is believe that this kind of rootstocks do not show incompatibility problems with scion sweet cherry cultivars.

Preliminary results of propagation of several cherry rootstocks by green cuttings

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Abstract
The propagation by green cuttings of the rootstock P7 (P. padus L. x (P. cerasus L. x P. avium L.)) and of several clones of local sour cherry (P. cerasus L.) ‘Latvijas Zemais’ was investigated in 2014 in Latvia State Institute of Fruit-Growing. Green cuttings with three nodes were made in second decade of June. In control variant the lower part of cuttings was dipped in the solution of indolyl-3-butyric acid (IBA), 50 ml/L for 15 hours, after the cuttings were planted in substratum of neutralized and enriched peat and perlite (in proportion 10:1), grown in greenhouse with automatic air moistening and floor heating system, fertilized with complex fertilizer VITO Universal. Following treatments were compared to the control for P7 and ‘Latvijas Zemais’51: dipping in the solution of organically produced rooting stimulator Vitmin (10 ml/L), adding the preparation Trihodermin (containing Trichoderma harizanum Rifai) to peat-perlite substrate, growing in greenhouse without floor heating, fertilizing with Kelpak (containing seaweed extract). For P7 as additional variant the dipping in less concentrated solution of IBA (25 ml/L for 15 hours) was applied. In the middle of August rooted cuttings were potted and classified: 1st category - plants with well developed root system and new shoot, 2nd category – plants with good root system but little or no new shoot, 3rd category – plants with callus and without new shoot. The length of shoot, the diameter of root neck, mass of roots and shoot were determined at the end of vegetation period for the plants of 1st category.

The positive effect of floor heating was significant: in the greenhouse with floor heating the average proportion of rooted cuttings was 68% for P7 and 58% for ‘Latvijas Zemais’51, but without floor heating it was 39% and 43% respectively. The treatment with Vitmin resulted in decreased root and shoot growth for both rootstocks, but in increased callus formation for ‘Latvijas Zemais’51. The treatment with less concentrated solution of IBA improved significantly the rooting as well the shoot and root growth for P7, but it did not influence the diameter of root neck. The treatments with Kelpak and Trihodermin did not influence shoot and root mass for P7 and ‘Latvijas Zemais’51. Root neck was significantly thinner and shoot was longer in the variant with Trihodermin than in control for ‘Latvijas Zemais’51, but such effect was not observed for P7. Total amount of rooted cuttings did not differ significantly among clones of ‘Latvijas Zemais’ but significantly higher percentage of 1st category plants was detected for the clone ‘Latvijas Zemais’10-2-26.
'Oblačinska' sour cherry as potential dwarving rootstock for sweet cherry

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Abstract

This paper considers the possibilities of usage 'Oblačinska' sour cherry variety as a vegetative rootstock for sweet cherry. The observation was done in experimental orchards established 2013. Sweet cherry varieties Burlat, Van, and Bing were grafted on 'Oblačinska' sour cherry and mahaleb. Aimed comparative investigations the trees were planted in experimental orchard in village Lakavica, Stip [Central Macedonia].

The trees on 'Oblačinska' were planted on distance 4 x 2 m using support system, while those on mahaleb (Prunus mahaleb L.) planted on distance 4.5 x 4 m. Up to day compatibility of the rootstock and scion, survival of the trees, vegetative growth and formation of May bouquets were followed. In porpoise better anchorage of the trees and avoid of supporting system some of the trees grafted on 'Oblačinska' sour cherry were planted deeper for 20 cm that normal planting.

Preliminary results shown that 'Oblačinska' sour cherry variety have potential to be used as a dwarfing rootstock for some sweet cherry varieties. For sure early precocity of trees grafted on 'Oblačinska' was noticed.

Comparative investigations of 'Oblačinska' sour cherry on own root and grafted on Mahaleb

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Abstract

'Oblačinska' sour cherry originates from the population of sour cherry from the Balkan Peninsula. This variety has high economic value for the Balkan region. In the Republic of Macedonia 'Oblačinska' sour cherry is a unique cultivar which is cultivated in commercial orchards. Until some period the orchards are mainly established by own rooted trees. Despite numerous advantages, own rooted plants have a lot of disadvantages such as: poor development of root system, drought sensitivity, suckering, uniformity of the trees, mechanical harvest unsuitability, root borer suffering in dry conditions.

In the last years mahaleb (Prunus mahaleb L.) starting to be used in sour cherry commercial orchards as a rootstock.

This paper present results of comparative investigation of 'Oblačinska' sour cherry planted on own roots and grafted on mahaleb (Prunus mahaleb L.). The research was conducted in productive orchard in Tikves region (Central part of Macedonia). The aorchard was established in 2002 and the research was conducted in next seven years. Two variant of grafted trees on mahaleb were evaluated, grafted on height of 10 and 80 cm. Own rooted trees were used as a control. The vegetative growth of the trees, the yield and the fruit quality were followed during the investigation. The died trees resulted from attack of root borer (Capnodis tenebrionis L.) was followed, too.

Good compatibility on 'Oblačinska' sour cherry with mahaleb rootstock was noticed from the recorded data. The trees are medium vigorous, they are more tolerant to drought and attacks of root borer. The high grafted trees have better growth, and the yield and the fruit quality are better compared to other variants. These trees are wit better anchorage and suitable for mechanical harvesting by tree shaker.
The rootstock and training system for sweet cherries in BiH

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Key words: soil condition, climatic condition, Prunus mahaleb L., Prunus avium L.

Abstract

Sweet cherry is a fruit species in which the path from extensive to highly intensive growing systems passed in a relatively short time. Development of growing systems went analogous with a concept in other fruit species: selection of dwarf rootstocks, the proper choice of a combination variety/rootstock and the development of a training system in accordance with the concept of the spindle. But it soon became clear that due to the specificity of cherry organogenesis, the spindle is not the best solution for this species. The territory of Bosnia and Herzegovina in the cherry growing areas is characterized by the presence of moderate-continental and modified mediterranean-type climate, that has an impact on the selection of appropriate rootstocks and growing systems. This paper analyzes the representation of rootstocks and training form for cherry in different climatic and soil conditions of Bosnia and Herzegovina. In the production of cherries in BiH generative rootstocks (Prunus avium and Prunus mahaleb) prevail with more than 97%, while importance of vegetative rootstocks in production started in recent years. In Herzegovina region in light soils with a higher content of carbonates, with greater amounts of rainfall unregularly distributed during the year and higher average temperatures the main rootstock is mahaleb. Trials with dwarf rootstocks (in Gisela type) and spindle training system generally have not gained results. Slightly better results are achieved by using Colt rootstock. The «vase» is dominant training form where low-trunk and large number of stronger branches in the base aim to control the vigority and create conditions for better access to the interior of the tree, primarily for easier harvesting.

Fruit growers in the northwest part of BiH besides the traditional growing of plums, apples and pears in recent years has been showing an interest in production of cherries. This region is characterized by the presence of heavy soils, slightly to strongly acid reaction, and large amounts of rainfall (over 800 mm) relatively favorable distributed during the year. In addition to wild cherry seedling as the leading rootstock in older orchards, there is also a rootstock Colt. In recent years more and more new orchards were planted at less vigor rootstocks (Gisela 5 and 6). In the highest percentage of newly planted orchards dominate spindle training system, as a major training form for other fruit species (apple, pear) in the region. Intensification of cherry production in BiH depends on introduction of new combinations variety/rootstocks followed by choosing the optimal training form with maximum consideration of climate and soil specificity of individual regions.
Optimization of light interception in high density sweet cherry orchard

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Abstract

In high density sweet cherry orchards the crop canopy is fragmented, arranged in linear lanes. In between the tree lanes the alleyway provides the space for technology measures and machines. The area rate of orchard covered by canopy considerably influences the PAR (photosynthetic active radiation) absorption potential of the orchard.

Our first step in Hungary towards intensification of cherry orchard was the "modified Brunner Spindle" in spacing 6x4 to 5x3 m, introduced in the 80-es of last century. The canopy covered rate of the orchard area increased from 0.4-0.5 to 0.6-0.7 with decreasing spacing. The denser "Hungarian Cherry Spindle" with spacing of 4x2m slightly increased the rate of canopy covered orchard area (0.6-0.8) but in this system the leaf and shoot population is more and more crowded in a reduced space. This situation may provide both advantages and disadvantages considering environmental physiology and technology aspects.

The total leaf area of trees and the leaf area index (LAI) is considerably influenced by the cultivar and rootstocks. The LAI and so the PAR absorption capacity of orchard shows typical course during the season, influenced by the applied pruning too. On dwarfing rootstock (GiSelA 5 or 6) the LAI values of trees reach a maximum of 2 to 3, while the LAI of tree on vigorous rootstocks can achieve 7 to 8. At the stage of LAImax the canopy walls of trees intercept 60-90% of PAR, which means 40-75% PAR absorption calculated for the whole orchard area.

Environmental factors considerably influence the performance of net CO₂ assimilation of leaves in daily and seasonal course as well. Our investigation confirmed the role of water supply and temperature of leaves affecting the stomatal conductance. The stomatal conductance of leaves on different rootstocks at appropriate water supply showed daily maximum in the Tleaf range of 30 – 40 °C, while in the Tleaf range of 40 – 45 °C the conductance rapidly decreased. This down regulation on dwarfing rootstock is faster, while on vigorous rootstocks slower. Since the water supply of leaves on dwarfing rootstocks due to their hydraulic system is more vulnerable, and the exposition of leaves to solar radiation is higher due to the scarce canopy, the leaves get faster into the critical Tleaf range. In contrary trees on vigorous rootstocks (‘Bogdány’, ‘Egervár’ and ‘Magyar’) with higher LAI, which is linked with higher shading, may show more efficient PAR utilization.

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Fruit quality depending on the ratio of leaf to fruit with cherry rootstock Gisela 5

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Abstract

In Bulgaria the most popular pad in cherry seed are forms of P. mahaleb and P. avium. P. mahaleb is widespread in southern Bulgaria, while P. avium in northern Bulgaria. Were selected two branch forms on P. mahaleb, IK-M8 and IK-M9.

With the advent of intensive gardening in Bulgaria imposed several rootstock: Gisella 5, Gisella 6 and MaxM14, but for Gisella 5 although opinions are divided about whether it is suitable for our area. To give manufacturers information on habitus and fruit quality, one of the tests with what is the best balance between fruit and leaf to obtain competitive fruit. Four options have been observed with two variants, girdling with and without girdling, they have taken the following indicators: size and weight of fruit.
Parallel Trident Planting System and the Behaviour of Some Cherry Varieties

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Keywords: Cerasus avium, cultivars, rootstocks, canopy, growth, productivity index

Abstract
The parallel Trident canopy was studied in a young sweet cherry orchard planted on the Romanian plain on cernozem-black soil in early spring of 2008. Nine sweet cherry varieties: Celeste, Ferrovia, Kordia, Lapins, New Star, Van, Early Red, Firm Red and Giant Red, were planted at 4.0 x 2.0 m. The first six varieties were grafted on PHL-C rootstock, Giant Red on CAB 6P, Early Red on CAB 11E, while Firm Red was grafted on CAB 6P and CAB 11E respectively. Trees were trained on a wire trellis fixed on 3.5 m high pine poles. Typical winter and summer pruning, completed with the three axes leading on trellis wires have been used to form a parallel Trident canopy. An integrated pest management was applied. The vegetative growth was evaluated using tree height and trunk cross sectional area. Trees productivity indexes (Pi 3 and Pi 4) were compared after harvest by reporting the yield and the number of fruits per unit of trunk cross-sectional surface area (TCSA). Some fruit characteristics were analyzed. CAB 6P, gave the most vigorous trees, followed by CAB 11E and PHL-C. Van/PHL-C was the most productive, followed by New Star/PHL-C and Giant Red, grafted on CAB 6P. CAB 6P showed to determine higher yield and better fruit quality. A good behavior in terms of yield and excellent fruit quality was registered with Giant Red and Early Red. The parallel Trident shows to be a suitable planting system for the medium density sweet cherry orchards with semi-vigorous and semi-dwarfing rootstocks.

Training systems of sweet cherries in Belgium

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Abstract
Advising a planting distance or training system is difficult. Several factors as soil type, variety or rootstock have a big influence. Also the experience of the grower is an important factor. If one has little experience with the training and pruning of sweet cherries, it may be appropriate to plant wider. With intensive plantings it is necessary to prune consistently to avoid problems with growth.

In 2003, we started a trial with 4 planting systems with ‘Sweetheart’ on Gisela 5. Until now the classical system and the English system do it well. The Spanish bush, on the other hand, had very low productions in the first years. In the V-system the total production per ha is obviously lower than in the other 3 systems, due to some disappointing productions during the last years. In a second trial ‘Kordia’ and ‘Sweetheart’ on Gisela 5 were planted in a V-system in spring 2005. A V-system is a very expensive system that is also very labour intensive. If one wishes to plant a V-system, then it is best to choose a self-fertile variety. ‘Sweetheart’ gets in this trial clearly better yields than ‘Kordia’. On Kordia the vigour was quite strong, even when the trees were repeatedly root pruned. A variety like ‘Kordia’ yields insufficiently on the leader branches. This kept the production each year too low.

In spring 2009 ‘Skeena’ on Gisela 6 was planted as a classical system and according to the “UFO”-method. “UFO” stands for Upright Fruiting Offshoot. The whips were planted under an angle of 45°. From the central leader shoots emerge which are tied so that they grow upright. This results in a narrow system. Up to now the “UFO”-method is very labour intensive, especially the tying takes time. In the first years the production volume of the classical system is much larger and therefore, the yield is 35 % higher than for the “UFO”-system. The fruit size is also slightly smaller for the “UFO”-system.
New training systems to improve the profitability of cherry orchards

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Key words: sweet cherry, training system

Abstract

Currently more than 90% of the cherry trees are trained in vase in France. Planting densities are from 230 to 500 trees per hectare. Full bearing often takes a long time and the trees are difficult to harvest. To make cherry production more reliable it is necessary to protect cherry trees from rain (cracking) and may be also from insects (especially Drosophila suzukii). For all these reasons it’s important to reduce the canopy and the thickness of the tree hedge. Trials as well as field observations have been carried out from 15 years about intensive training systems in axis, bi axis, fan, fruiting wall, and more recently KGB, UFO. We have been used different rootstocks, Tabel Edabriz®, Gisela 6®, PHL-A®, Weirroot 158®, Piku 1®, MaxmaDelbard 14Brokforest®. The choice of the training system depends on varieties, rootstocks and soil’s fertility. With dwarfing rootstocks like Tabel®, Piku 1 it is possible to train the trees in axis. With more vigorous ones it is better to dilute vigor using more axis (bi axis, fan). With KGB and UFO which need vigor enough to regularly renew the shoots, it’s important to obtain a good balance between vigor and production.

Some experiences at the 'Oblačinska' sour cherry crown training

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Abstract

In this paper different approach of sour cherry pruning in accordance of tree crown formation is presented. In the practice fruit plant material produced with different technologies were used. In purpose achieving higher height of the nursery trees, in most of the nurseries removal of features is done. This nursery trees do not have necessary buds in needed height of the plant for formation of the tree crown and formation of the crown is prolonged and in most of the cases difficult to conduct. In this paper methods for production of high quality fruit plant material (with features) and tree crown formation, spindle bush and vase from different categories of fruit plant material (with or without features) are presented. The investigation is conducted, bought in orchard and in nursery. As a material sour cherry variety 'Oblačinska' on own root and grafted on mahaleb (Prunus mahaleb L.) was used. It was consider that for good survival, development and earlier and easier tree crown formation usage of high quality fruit plant material is essential. Successful tree crown formation can be conduct even at the fruit plant material with lower quality with usage of appropriate pomotechnical measures, but with a prolongation for minimum of one vegetation.
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