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HIGH DENSITY SOUR CHERRY TREE MANAGEMENT

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Sour cherry tree management

- Cultivars
- Tree – harvesting method
- Concept of orchard for cherry harvester
- Planting system
- Training & pruning

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CULTIVARS




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Cultivar

- English Morello (Schattenmorelle) – 70%
 - Self-pollinated
 - Dark red color (high value for processing)
 - Resistant - brown rot of stone fruits
 - Sensitive - leaf spot disease
 - Weak and slow growth
 - Requires rich soil (or irrigation)



English Morello sets only flower buds along the shoots, which terminated with one leaf bud. After fruiting, the shoots are left as bare wood.

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Cultivar

- English Morello (Schattenmorelle)
 - Small trees (easy hand picking)
 - Difficult to shape
 - Weeping shape of the crown
 - Short trunk
 - Suitable for high density orchard





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Cultivar

- Debreceni Botermo (originated „Kerezer”)
 - Large tasty fruits (dessert & processing)
 - Early ripening
 - Grows vigorously - very suitable for trunk shaking
 - Renewal pruning is not always effective
 - Very tolerant of light, sandy soil
 - Allogamous (requires pollinating cultivar with the similar time of flowering)



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Cultivar

- Other cultivars
 - Kelleris 16
- Kerezer (Pandy 103)
- Local Polish cultivars







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Rootstock

- Conventional orchard
 - Trunk shaking
 - Seedling Mazard (*Prunus avium*)
- Dwarf orchard
 - Continuous harvesting
 - Seedling Mahaleb (*Prunus mahaleb*)

Dwarf rootstocks are too expensive for Polish growers, because of low prices of fruits. (tree on standard rootstock in nurseries - only 4 \$.)

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Rootstock


- Conventional orchard (Seedling Mazard)
- Dwarf orchard (Seedling Mahaleb)
- English Morello - soil quality
 - Poor sandy-loamy soil - Mazard

The trees grafted on Mahaleb cherry grow worse, forming by 12% thinner trunks and by over 20% smaller crowns as compared to Mazard cherry trees

- Fertile soil - Mahaleb

The crowns of trees grafted on Mahaleb are more than 40% bigger than those on Mazard

Significantly higher yields are harvested from the trees on Mahaleb cherry than on vegetative rootstocks (Colt, PHL-A, F 12/1), and by 70% higher than on Mazard cherry



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TREE

- HARVESTING METHODS



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Standard trees - harvesting

- Shakers + catching frame (hand operated)






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Standard trees - harvesting

- Shakers + mechanical catching frame
- Automatic shaker + mechanical catching frame







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Standard trees

- **Dimensions**
 - Height 4 m
 - Width 3 m
 - Planting system 5 x 4 m
- **Training system**
 - Long trunk (min) 0.7 m
 - Central leader
 - Rigid limbs
 - The gaps between trees (no contact during shaking)




The date of first harvest depends length and diameter of the trunk

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Standard trees - pruning

- **Effects**
 - Vertical and rigid central leader
 - Rigid branches (easy vibration propagation)



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Not for English Morello

- English Morello is the main variety (75%)
- **How to train ?**
 - The central leader
 - Trunk (50-60 cm; 4 years)
- **Weak propagation of vibration**

New concept of tart cherries harvesting was necessary

- **Problem**
 - Bark and wood diseases
 - Training and pruning system
 - Harvester

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SOUR CHERRY HIGH DENSITY TREE CONCEPT

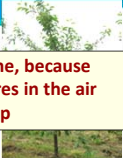


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High density trees

Just after harvest (August) is the best pruning time, because of small concentration of bacteria and fungal spores in the air and the wounds after cut quickly dry up

- **Main rules**
 - Some methods of apple trees pruning can be useful on cherries
 - Cherries by nature are similar to apple semi-dwarf trees
 - Spindle bush crown is the most suitable
 - Cherries do not create the strong vertical central leader (as pear)
 - Cherries set up a flower buds on young 1 year old shoots
 - The trees must be pruned tight (heavily) – small canopies
 - The volume between trees should be fill up as fast as possible
It means that the distance between trees should be also small (1.5 m)
 - It depends also on cultivar, soil quality and rootstock





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High density trees – planting

- **Cultivar**

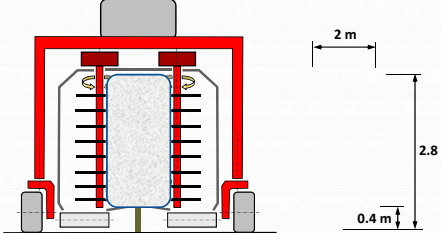
• North Star	1.2 – 1.5 m
• English Morello	1.2 – 1.5 m
• Kelleris 16	1.5 m
• Nefris	2.0 – 2.5 m
• Debreceni Botermo	2.5 m

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Dwarf trees - harvesting

- Shaking directly of fruiting shoots
- The long trunk is not necessary




The main limitation are the machine external dimensions (moving inside & outside of orchard)

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Dwarf trees

- Dimensions**
 - Height 3.0 m
 - Width 2.0 m
 - Planting system 4x1.6 – 4x2 m
 - 3.5x1.5 – 3.5x2
- Training system**
 - Short trunk (min) 0.4 m
 - Central leader
 - Flexible limbs, shoots
 - No gaps between trees
 - Continuous hedge - less fruit loss
 - More limbs parallel to the tree line – less bark damages

The trees can be harvested in a second leaf




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Tree - harvesting method

	standard	dwarf
Tree type		
Height (m)	4	2.5
Width (m)	3	2.0
Planting system (m)	5x4; 4x4	3.5x1.5 – 4x2.5
No. trees/acre	200; 250	760; 400
Min. trunk height (m)	0.7	0.4
Central leader	Yes	Yes
Branches	rigid	flexible

The dwarf trees can be harvested with the use of the new technique



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Dwarf trees

- Distance between trees**
 - Fertile soil 4.0 m
 - Poor soil 3.5 m

Sour cherry harvester requires less room than conventional shakers



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TRAINING & PRUNING



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Dwarf trees - training


- Main rules**
 - Vertical central leader is necessary
 - Preventing flowering
 - The trees show the tendency to blooming and fruiting in the first year
 - Flowering hampering the development of normal crown



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Dwarf trees - training

- **Training system** (after tree planting)
 - All shoots have to be strongly shortened except central leader
 - Only 1-2 buds can be left
 - Trunk should not be shorter than 0.5 m



Such a training system will stimulate the growth of trees and development of the crown with the strong vertical central leader.

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Dwarf trees - training

- **Effects** (2nd year)
 - From left buds grow 1-2 new springy branches
 - Central leader dominates the lateral branches
 - Cherries fruiting in the second year



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Dwarf trees - training

- **Training** (2-3rd year)
 - None, only some cosmetic cut
 - Removing shoots competitive with central leader
 - Removing excessive flowers on the top of central leaders



At 3rd year the gaps between trees will be fulfilled, the trees will be 2 m height.
In 3rd-4th year they will reach max. height (2.5 m)

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Dwarf trees - renewal pruning

English Morello set only flower buds along the shoots, which terminated with one leaf bud. After fruiting, the shoots left as bare wood.



Therefore, renewal pruning is necessary

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Dwarf trees - renewal pruning

- **Main rules**
 - The main branches not older than three years
 - Each year, but first time at fourth leaf
 - „Long cut” (10 inches) (dowel, rootlet, spigot)
 - Removing branches perpendicular to the tree row
 - Hanging down branches below 50 cm should be removed




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Dwarf trees - renewal pruning

Before



After



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Dwarf trees - renewal pruning

- Effects
 - Stimulates the growth of new fruiting shoots
 - Exchanging old wood by the new one
 - The branches on tree are always springy




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Dwarf trees - renewal pruning

- Effects
 - The branches on tree are always springy

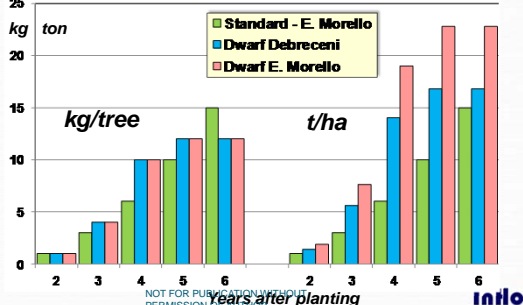


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New orchard type - advantages

- Higher yield
- Earlier full yield



Years after planting	Standard - E. Morello (kg/tree)	Dwarf Debreceni (kg/tree)	Dwarf E. Morello (kg/tree)	Standard - E. Morello (t/ha)	Dwarf Debreceni (t/ha)	Dwarf E. Morello (t/ha)
2	~1	~1	~1	~1	~1	~1
3	~3	~4	~4	~3	~4	~4
4	~6	~10	~10	~6	~10	~10
5	~10	~12	~12	~10	~12	~12
6	~15	~12	~12	~15	~12	~12


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Conclusions

- Dwarf sour cherry orchard
 - Higher yield (t/ha)
 - Faster first crop (3rd leaf; short trunk)
 - Easy training & pruning
 - Requires different harvesting method (short trunk)
- Continuous moving sour cherry harvester – cherry tree
 - Optimal for small trees with flexible limbs (eg. English Morello)
 - Can harvest of fruits from young trees (3rd leaf)
- Continuous moving sour cherry harvester – costs
 - Harvesting period of cherries should be extended
 - Harvesting of other species should be considered (plums)

Conventional orchard harvested with the use of trunk shakers are still recommended for smaller cherry orchard (< 4ha; 10 acre)



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