04F

Survey among orchard owners OUTCOMES



Number of respondents

Number of respondents



1 from Austria ticked "I disagree" to question No. 1 asking for the permission to use the data, but filled in everything including the name.

■ AT ■ DE ■ SK

Management mode (Q 3)



AT DE SK

Management mode (Q 3)

Lovens, Auf dem Abendsbauer (Aachen): Innovative, in this case with walnuts and wild fruits
 Jörg Baurle, Wieser GbR (Amtzell): Composition of fruit trees on vigorous and smaller rootstocks, wild fruits and non-fruit trees
 Christoph Meixner, Regenerative und Soziale Landwirtschaft e.V. (Eschwege): Combining trees and shrubs, varying distances

Josef Preininger (Lembach bei Riegersburg): environment & biodiversity friendly agriculture

(Beňušovce 1): combination of intensive and extensive Ľuboš Molitotoris, organic farm Dubový háj (Hrušov): permacultural Martin Hrehor. Ovocinár Hrehor (Skalica): completely without spraying Ivana Balážová. Orchard Sad Lívia (Kolíňany): permacultural

Location of the orchards (Q 4)

• All countries



Location of the orchards (Q 4)

• SLOVAKIA



Outcomes

• AUSTRIA



Location of the orchards (Q 4)

• GERMANY







AT: Size of orchards (ha)



■ orchard 1 ■ orchard 2 ■ orchard 3 ■ orchard 4 ■ orchard 5

DE: Size of orchards (ha) 4,5 4 3,5 1 0,5 0 5DE 6DE 2DE 7DE 8DE 9DE 10DE 13DE 14DE 15DE 16DE 17DE 18DE 19DE 11DE 12DE 20DE 24DE Respondent no.

■ orchard 1 ■ orchard 2 ■ orchard 3 ■ orchard 4 ■ orchard 5

SK: Size of orchards (ha)



■ orchard 1 ■ orchard 2 ■ orchard 3 ■ orchard 4 ■ orchard 5



Slope (Q7)

Slovakia: Slope in orchards [%] Slope in orchards (%) 52 20 12 1SK 2SK 3SK 4SK 5SK 6SK 7SK 8SK 9SK 10SK 11SK 12SK 13SK 14SK 15SK 16SK 17SK 18SK 19SK 20SK 21SK 22SK Respondent No.

Germany		Austria	
Resp. No.	%	Resp. No.	%
2DE	10	1AT	5
5DE	5	3AT	15
6DE		4AT	5
7DE	10	21AT	
8DE		22AT	
9DE	3	23AT	
10DE		25AT	15-30
11DE		26AT	20-35
12DE	2	27AT	
13DE	0	28AT	15-30
14DE		29AT	15-30
15DE			
16DE	0		
17DE			
18DE	3		
19DE	5		
20DE	25		
24DE	15-30		

Soil type (Q 8)

Soil type in orchards



 Mean number of species grown

 12,00
 10,56

 10,00
 10,56

 8,00
 7,20

 6,00
 5,66

 4,00
 10,56

 2,00
 10,56

 0,00
 10,56



AT DE SK







Median number of species grown

Frequency of grown species in all countries 60 No. of respondents growing the species 48 50 46 39 40 32 31 30 24 20 16 16 16 15 15 13 12 12 10 10 10 10 9 9 9 9 9 10 6 Blackcurrant Redcurrant Rosavillosa APTICOTS 585tatoon bein Service tree Elderbern Apples Walnuts Cherries Quince Dogwood Peaches Hazelnuts Mediar Sourcherny Chestnuts sea buckthorn Morusalla Morusniera Greenegee Sourcherny Gooseberry 105ta berny Grape wine filetree Almonds PIUMS Hawthorn Rowan Pears GOİ

Species

Species grown in the orchards in the respective countries



Species

AT DE SK

Species grown in the respective countries



Management measures (Q 10)



AT DE SK

Management measures (Q 10)

Management measures 20 19 18 18 16 15 16 No. of respondents 14 14 14 13 12 12 12 10 10 8 8 8 6 6 5 4 Λ 3 3 2 2 2 2 0 0 0 Ο 0 AT DE SK Measures ■ W: water source, reservoirs W: w. retention in landscape ■ W: automatic irrigation W: manual irrigation W: anti-hail system T: frost protection s. S: till S: no-till ■ S: mulch organic S: mulch plastics S: fertil. - soil analysis ■ S: fertil. - plant condition S: fertil. - customary procedures S: mycorrhizae U: annual cover c. U: perrenial cover c. U: mowing & removal U: mowing & mulching U: grazing C: pruning C: protection a. Biotic C: functional biodiversity Other No measures

- No fertilizer (yet) (5)
- tree pit with horse manure substrate, partially fertilized with wood ash
- When necessary and after analysis: chalk, primary rock flour and wood ash. NO nitrogen fertilizers
- Liming on the basis of soil analysis (amount unkown). Additionally manure of own animals (around 6 m³, not used every year)
- Pasturing with cows, geese and chicken. Compost, wood ash in small amounts. Areal composting on the tree discs, amounts are not measured.
- Putting compost / composted wood chips around young trees in spring if necessary
- compost, primal rock flour, bentonite, horn shavings
- Compost (tree pits)
- Chalk, primary rock flour, horn shavings
- Sometimes compost mixed with coal, primary rock flour, sand is put on tree pits. Additionally horse manure from may till august as protection from evaporation.

No fertilizer (2) compost in small quantities / as necessary (tree pits) (3) in the past fertilized with manure, not anymore, as we have no more livestock slurry once per year horse manure in tree pits once per year (in spring) (2) Fertilizing as required and by chicken / geese

I occasionaly use manure. By grazing animals (2) Manure, spreader I cover the tree pit with cardboard, straw or other organic material, on top I apply rabbit manure approx. 70 l per year Partially matured horse manure, applied to the soil - away from the trunk, covered with straw or wood chips. No fertilizer green manure, compost, leachate (chicken droppings) mulching with the mown material Before planting grass-clover mixture, 200 kg manure/tree + wood chips, since then only wood chips compost: two shovels to each tree every 3 years, mulching with organic matter, grazing chicken manure Pruned branches are left under trees, grass clippings are mulched, and grazing horses also fertilize manure, 20 t/ha, by spreading compost, autumn application chicken and rabbit manure, compost, once a year in the autumn horse manure Overall, the grassland in the orchard is not fertilized, only the individual trees manure 50 l per planting hole, compost 50 l per planting hole, liquid organic fertilizer in watering once a year manure/compost, once every 3 years, approx. 200 l/tree manure, 60 t/ha, once every 3 years our own mature manure and compost, half a wheelbarrow to berries, a wheelbarrow to younger trees

Fertilizing materials used



AT DE SK

Fertilizing materials used



Observed climate change impacts (Q 12)



Negative phenomena observed

AT DE SK

Observed climate change impacts (Q 12)



Observed climate change impacts (Q 12)

Other:

Cold weather during the flowering Diplodia, Neonectria ditissima, Scolytus mali, damage by animals during pasturing

young trees don't survive without consequent watering alternation of cropping of pears early fall off of apples quick rotting in storage

90 % of apple and pear trees did not bloom in 2023, apparently due to the extremely dry summer before

Not affected species, varieties, rootstocks (Q 13)

SP: Juglans regia (3), Cydonia oblonga (3), Cornus mas (1), unkown cidre apple (1), Castania sativa (1), Mespilus germanica (2), Sorbus domestica (1), Pyrus communis (2), Prunus domestica (1)
VAR: Old cherry trees
Apples: Cox Orange, Teser, Berlepsch, few apple varieties from warm regions, e.g. Melrose
ROOTSTOCKS: ?
FORM: Standard trees

VAR: Apples: Maschanzker (2), Kuhländer Gulderling, Bohnapfel, Ananasrenette, Lederapfel, Passamaner

SP: Hippophae rhamnoides, Mespilus germanica, Cornus mas, Amelanchier, Aronia, Cydonia oblonga

all, even figs were affected by the drought

VAR: Apples: Topaz, Malinové hornokrajské (Oberlander Himbeer) resistant to powdery mildew and scab, Angold, 'Gazdov Slnečné' - undamaged by drought, Florina - long storage without diseases **ROOTSTOCKS:** Seedling rootstocks water voles: location of the tree rather than by the species or variety or rootstock

Measures taken sofar (Q 14)

Measures against negative CC impacts taken



Measures taken sofar (Q 14)

Measures taken against the negative CC impacts



AT DE SK

Measures taken sofar (Q 14)

Measures taken against negative CC impacts



• Frost:

- Selection of specific site
- covering with non-woven fabric (smaller trees)
- choice of a species that is frost-resistant (dogwood, medlar, currants)
- choice of later blooming varieties
- Šitt's summer pruning method for good growing trees to spread the blooming season

• Winter problems:

- trunk protection with loam / chalk (with latex)
- metal mesh instead of plastic for trunk protection
- shaking snow off the trees



• Drought:

- Tropaeolum and Calendula officinalis in the undergrowth
- (high) mulching of tree pits / berries (straw, cardboard, woodchips + green clippings)
- Regular fertilization
- Water retention measures in the landscape + surface wells + ponds, hoses, pump
- Rootstocks mainly seedlings
- Swales along the contours and then planting on their ridges
- Windbreaks
- Grafting on self-sown rootstocks
- Breeding locally adapted varieties



• Drought:

- slurry-spreader for manual irrigation (10 h /ha /year); hoeing tree pits (3-4x20 minutes/tree/year)
- Irrigation (of young trees): 20 30 l per tree, biweekly from April to June; 30-40 l, IBC-tanks on a car trailer
- Selection of specific site & species
- Establishment of hedges and spinneys
- Aeral composting
- Watering with water from rainwater retention basin
- Planting in shaded sites
- Use of biochar



- Heatwave:
 - planting in shaded sites
- Torrential rain:
- Hails:
 - selection of more sites to spread the risk
- Storm:
- Strong wind:
 - professional pruning for good statics
 - establishment of hedges and spinneys
 - Hedge / windbreak
 - tree stakes for young trees



- Bacteria, viruses, fungi:
 - Selection of resistant varieties

• Invertebrates:

- Manual killing of carpenter moths
- Benjes-hedge in the north with lots of birds and other wildlife
- Chickens + pigs in the lower area keep trunk insect-free (esp. In spring and autumn)
- ants + aphids: application of argan oil, 2 days/year, approx. up to €100
- treatment against aphids with PrevB2
- Biodiversity
- Undergrowth management to support natural predators
- mechanical removal of moths



- Vertebrates:
 - Birds:
 - Protection of some berries by netting during the ripening period
 - White grapes over blue ones
 - Rabbits:
 - trunk protection against rabbits
 - Deers:
 - wooden construction to keep dear away
 - fencing, extensive time, constant repairs, cost approx € 10 000
 - Voles:
 - Stone protection of roots (2,5 h / tree)
 - Planting fruit trees close to forest trees and shrubs
 - Grafting pears on quince, not pear seedlings
 - Chickens + pigs
 - planting trees in pits lined with 70x70 to 100x100 cm mesh



Reasons for not taking measures (Q 16)

- Mulching the tree pit with horse manure effective enough
- water donations from the village
- Irrigation should be kept to a minimum, as otherwise you would keep the trees from growing proper roots.
- To date these phenomena appeared only local
- Expenditure
- Expenditure unproportional to effect
- Phenomena alternate from year to year
- Leave it to nature (protection over production)
- High costs
- Phenomena alternate from year to year
- We do not observe climate change. We only record weather variability
- Lack of government support

Orchards 4 Future – Education about climate change and adaption



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