



## Curriculum for qualification of „Specialist in Traditional Orchards“

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## Introduction

<b>Training aim</b>	<p>The training of „Specialist in Traditional Orchards“ intends to enlarge and deepen the classical vocational training within related fields. The curriculum offers a possibility to teach/learn and to discover new/forgotten knowledge about traditional orchards and ways of sustainable orchard management.</p> <p>One aim is to provide students the knowledge about traditional orchards in the fields of pomology, care &amp; management and processing &amp; marketing of their products. A second aim is to develop the needed skills and competences to integrate this knowledge and insight into different kinds of professional environments.</p> <p>The curriculum, based on ECVET (European Credit System for Vocational Education and Training) and using an output-oriented approach consists of units and learning outcomes describing the knowledge, skills and competences to be reached by students/trainees.</p>
<b>Total amount of teaching hours</b>	103
<b>EQF-Level</b>	L4 (in case of units tested in pilot courses also L3 and L5: Units 1, 4 and 7)
<b>Modules</b>	<ol style="list-style-type: none"> <li>1) <i>Pomology</i></li> <li>2) <i>Care &amp; management</i></li> <li>3) <i>Processing &amp; marketing</i></li> </ol>
<b>Target group definitions</b>	<p>Students in initial and accomplished vocational education and training, tertiary education, adult education in the agricultural, horticultural, environmental sectors. The curriculum is aimed at formal and informal educational institutions and organisations and all other interested groups dealing with traditional orchard topics.</p>
<b>Supportive materials and tools for the curriculum</b>	<ol style="list-style-type: none"> <li>1) <i>Material collection (knowledge base)</i> The comprehensive material collection (knowledge base) serves as a supporting tool for the use of the curriculum. The material collection comprises available literature, contacts, links and list of courses to different topics related to traditional orchards.</li> <li>2) <i>Picture pool</i> The pool of „traditional orchard“ pictures provides a great database of photos demonstrating different aspects of traditional orchards divided into three main thematic topics corresponding to the modules.</li> <li>3) <i>Teaching material (for selected units)</i> This educational material is designed for a pilot course with duration of 40 lessons of 50 minutes each, including training sessions that are taught in the classroom and practice sessions for outside (e.g. workshops, excursions). The didactic material was developed on the base of the expertise of the whole group and curriculum ECVET-sheets were elaborated by experts from the partner consortium in the ESTO project. The following teaching modules have been developed: Pomology: Getting the pomological base Care &amp; management: Propagating fruit trees for traditional orchards Processing &amp; marketing: Producing fruit juice</li> <li>4) <i>Expert text</i> The expert text is a knowledge base supporting the application of the teaching material and training preparation. All supportive materials and tools are also available on <a href="http://www.esto-project.eu">www.esto-project.eu</a></li> </ol>

**Short description  
of curriculum  
modules**

**Module  
Pomology**

**Extent**

1 unit, consisting of approx. 13 teaching hours (at 50 min.)

**Short description**

During attending the module 'Pomology', students get to know the features of the most common European fruit species (apple, pear, plum, sweet and sour cherry). This comprises origin, ecology, phenology, morphology of trees and fruit features of species as well as fruit features of important cultivars. Characteristics of old cultivars are presented with a special focus on their use in traditional orchards. Advantages and disadvantages of old cultivars are discussed with respect to their distribution, rareness, recommended growing conditions, appearance, taste and processing value. At the end of the unit, students will be able to identify the most common European fruit species by their features, to determine important cultivars by their fruits, to taste and to describe them. They will know where to find further information and thus will be able to enlarge their knowledge of cultivars on their own. Moreover, they will be able to choose suitable cultivars for establishing an orchard independently, to organise and conduct fruit exhibitions and to present fruit features to an interested audience on the occasion of such exhibitions.

**Module  
Care &  
Management**

**Extent**

6 units, consisting of approx. 40 teaching hours (at 50 min.)

**Short description**

The module 'Care & Management' consists of four major units. During unit 'Establishment', the students learn how to plan a new traditional orchard with respect to locality, production goals, varieties, tree size and planting pattern. Furthermore, they will get familiar with soil tillage, quality and storage of trees and techniques of planting and protection against rodents. At the end of the unit, they will be able to analyse a locality, draw a scaled plan, calculate the costs and conduct the establishment of a new orchard including the first pruning on their own.

Unit 'Care' deals with soil and climate conditions, condition of trees, rejuvenescence, phytopathology, ecology, equipment and cost account as a basis for orchard care. Students also get familiar with pruning and fertilizing trees as well as pest control and maintaining grassland and infrastructure like driveways. At the end of the module, students will be able to analyse the conditions within an orchard, develop a care and management plan and manage an orchard with regard to economic and ecological benefits according to a management plan on their own.

Unit 'Propagating fruit trees for traditional orchards' deals with the work usually done in tree nurseries: propagation (by use of rootstock, grafts; appropriate tools and methods), care for young trees, labelling, documentation and cost account. After attending this unit, students will be able to propagate fruit trees in a traditional way with regard to economic benefits on their own.

During unit 'Harvesting and fruit storage', students get familiar with stages of fruit maturity, fruit quality, harvesting and storage methods and the selection of appropriate methods according to the intended use of the fruits. They also learn how to identify storage diseases. At the end of the course, students will be able to conduct harvesting and fruit storage with regard to fruit quality on their own, including documentation and cost account.

**Module**  
**Processing &**  
**Marketing**

**Extent**

4 units, consisting of approx. 50 hours (at 50 min.)

**Short description**

The module consists of four units. Within the first unit of this module (12 hrs), students will get a first insight into the diversity of all important official requirements and conditions for running a fruit processing company. As it is not possible to get familiar with all details, the aim of the lesson is to inform students about legal and hygienic preconditions to be fulfilled for running a company. Regarding the very diverse possible marketing tools for traditional orchards products, the aim is to provide useful hints to visit relevant specific courses where topics connected to management and marketing are taught. Thus this unit informs students about the necessity of visiting other relevant courses (on hygiene, marketing etc.)

During the units 'Producing fruit brandy' (20 hrs), 'Producing dried fruit' (5 hrs) and 'Producing fruit juice' (13 hrs), students will become familiar with knowledge and skills to be gained in producing good fruit brandy, dried fruit and fruit juice. Firstly, the students will get some basic information about the importance of fruit selection for different processing methods and about machinery and technical equipment needed. Students should have an opportunity to gain practical experience in processing of fruits of traditional orchards and to try out some processing methods in practice. The quality of products from traditional orchards as well as their health and nutritional benefits are important issues involved in these units.

## Curriculum – overview

Unit no.	Focus group / unit name
	<i>Module Pomology</i>
1	Getting the pomological base (L3,4,5)
	<i>Module Care &amp; management</i>
2.1	Establishment – planning a new traditional orchard (L4)
2.2	Establishment – establishing a new traditional orchard (L4)
3.1	Care – analysing an existing traditional orchard (L4)
3.2	Care – implementing care and management for an existing orchard (L4)
4	Propagating fruit trees for traditional orchards (L3,4,5)
5	Harvesting and storing fruit (L4)
	<i>Module Processing &amp; marketing</i>
6	Getting clear with the official requirements for running a processing company (L4)
7	Producing fruit juice (L3,4,5)
8	Producing dried fruit (L4)
9	Producing fruit brandy (L4)

**Getting the pomological base**

L 3

**KNOWLEDGE****He/she is able to**

1. describe the basic features of the most important fruit species (apple, pear, plum, cherry and sour cherry) by the following points:
  - a) phenology
  - b) morphology of fruits
  - c) basic inner quality parameters of fruits (sugar/acid content, nutrition value)
2. explain the features of 10 fruit varieties for traditional orchards by the following points:
  - a) fruit morphology
  - b) vegetative features
  - c) phenology
  - d) tree vigour and natural habit
  - e) special properties (pest/disease resistance/susceptibility, processing value etc. )
3. explain the advantages and disadvantages of old varieties (special appearance, taste, rareness, remarkable products, healthy growing conditions, etc.)
4. describe the basic tastes and flavours of fruits and the methods of tasting fruits

**SKILLS****He/she is able to**

1. identify the most important fruit species and to distinguish them from each other
2. identify 10 fruit varieties from fruit samples, distinguish them from each other and describe their features (including taste and flavour)
3. collect a suitable selection of fruits based on a briefing

**COMPETENCES**

1. He/she demonstrates a basic selection of varieties of a traditional orchard for laymen to raise awareness of old varieties after being introduced.
2. He/she helps organising an exhibition of old fruit varieties by collecting fruit samples.

## POMOLOGY

Unit 1

## Getting the pomological base

L 4

**KNOWLEDGE****He/she is able to**

1. describe the features of the most important fruit species (apple, pear, plum, cherry and sour cherry) by the following points:
  - a) origin and ecological needs
  - b) phenology
  - c) morphology of trees, fruiting buds, fruits (most detailed)
  - d) inner quality parameters of fruits (sugar/acid content, nutrition value)
2. name the general requirements of the varieties suitable for traditional orchards
  - a) Requirements related to technology (tolerance to pests and diseases, competing plant species, abiotic growing conditions, special bearing habit etc.)
  - b) Requirements related to marketing and rural development (consumer's preferences, protection of cultural values etc.)
3. describe the features of 30 fruit varieties for traditional orchards by the following points:
  - a) Fruit morphology
  - b) Vegetative features
  - c) History and origin
  - d) Phenology
  - e) Tree vigour and natural habit
  - f) Yield and fruit quality (appearance and inner quality)
  - g) Special properties (pest/disease resistance/susceptibility, fertility conditions, recommended growing conditions, technology needs, processing value etc. )
4. explain the advantages and disadvantages of old varieties (special appearance, taste, rareness, remarkable products, healthy growing conditions, etc.)
5. describe the different tastes and flavours of fruits and the methods of tasting fruits
6. name sources, where to get old varieties from

**SKILLS****He/she is able to**

1. identify the most important fruit species and to distinguish them from each other
2. identify 30 fruit varieties from fruit samples, distinguish them from each other and describe their features
3. taste fruits, assess their tasting features and describe their taste and flavour
4. search further information on (more) fruit varieties and their features systematically in order to improve his/her knowledge
5. collect fruits for an exhibition of old varieties suitable for traditional orchards

**COMPETENCES**

1. He/she chooses varieties for the establishment of a traditional orchard suitable for the local growing conditions in his/her own.
2. He/she demonstrates the varieties of a traditional orchard on fairs and exhibitions to raise awareness of old varieties and their features on his/her own.
3. He/she organises and conducts exhibitions of old fruit varieties for laymen and people interested in pomology on his/her own.

## POMOLOGY

Unit 1

## Getting the pomological base

L 5

**KNOWLEDGE****He/she is able to**

1. describe the features of all European fruit species by the following points:
  - a) origin and ecological needs
  - b) phenology
  - c) morphology of trees, fruiting buds, fruits (most detailed)
  - d) inner quality parameters of fruits (sugar/acid content, nutrition value, health-preventive effects)
2. name and explain the requirements of the varieties suitable for traditional orchards
  - a) requirements related to technology (tolerance to pests and diseases, competing plant species, abiotic growing conditions, special bearing habit etc.)
  - b) requirements related to marketing and rural development (consumer's preferences, protection of cultural values etc.)
3. describe the features of all widespread old fruit varieties and national specialities for traditional orchards by the following points:
  - a) fruit morphology
  - b) vegetative features
  - c) history and origin
  - d) phenology
  - e) tree vigour and natural habit
  - f) yield and fruit quality (appearance and inner quality)
  - g) special properties (pest/disease resistance/susceptibility, fertility conditions, recommended growing conditions, technology needs, processing value, health-preventive capacities etc. )
4. explain the advantages and disadvantages of old varieties (special appearance, taste, rareness, remarkable products, healthy growing conditions, etc.)
5. describe the different tastes and flavours and their connection to detectable fruit quality parameters of fruits and the methods of tasting fruits
6. name sources, where to get old varieties from

**SKILLS****He/she is able to**

1. identify all European fruit species and to distinguish them from each other
2. identify given varieties from fruit samples on the base of literature and describe their features
3. taste fruits, assess their tasting features and describe their taste and flavour according to standard procedures
4. find new literature, organize and direct the collecting of fruits for an exhibition
5. give pomological advice for establishment and care of orchards as well as for processing and marketing
6. prepare teaching material for pomological trainings

**COMPETENCES**

1. He/she plans and conducts pomological trainings and exhibitions for junior pomologists.
2. He/she gives advice on suitable varieties to people working in care and management.
3. He/she gives advice on suitable varieties for special processing methods and marketing.



## CARE &amp; MANAGEMENT

Unit 2.1

**Establishment**

L 4

**Planning a new traditional orchard****KNOWLEDGE****He/she is able to**


1. explain the need of machine tracks for running a traditional orchard
2. name the legal demands and the standards of establishing a traditional orchard (tree density, diversity of varieties, etc.)
3. describe suitable varieties and species
4. describe different types of plans (inventory plan, design plan, implementation plan)
5. explain the basics of designing a plan (by hand and/or computer)  
what method of planning?
6. explain the structure of cost calculation (staff, material, machines and external services)


**SKILLS****He/she is able to**


1. plan a new traditional orchard (respecting demands of market, landscape, ecology, climate, etc.) and to define the production goal
2. choose the right locality, varieties, distance between the trees
3. draw a scaled plan of the orchard (including borders, distribution of varieties or species, driveways etc.)
4. calculate the costs of establishing a traditional orchard

**COMPETENCES**

1. He/she does an analysis for the establishment of a new traditional orchard on his/her own.
2. He/she creates and works out a plan for a traditional orchard on his/her own.

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CARE & MANAGEMENT		Unit 2.2
<b>Establishment</b> Establishing a new traditional orchard		L 4
<b>KNOWLEDGE</b>  <b>He/she is able to...</b> <ol style="list-style-type: none"> <li>1. explain appropriate soil tillage techniques</li> <li>2. describe criteria to check the quality of delivered trees</li> <li>3. describe basics about storage conditions for trees</li> <li>4. explain techniques to plant a standard tree (planting, staking, watering, fertilizing, etc.)</li> <li>5. describe protection systems against animals (field mice, cattle, etc.)</li> <li>6. describe pruning and forming techniques</li> </ol>	<b>SKILLS</b>  <b>He/she is able to</b> <ol style="list-style-type: none"> <li>1. work with a given plan for establishing an orchard</li> <li>2. do soil tillage and prepare a planting hole</li> <li>3. control the good quality of trees delivered (size, health status, etc.) and store them professionally</li> <li>4. implement the planting and managing system according to the plan</li> <li>5. plant the tree correctly</li> <li>6. protect the trees against animals</li> <li>7. prune and form the crown of young trees during the first years</li> </ol>	
<b>COMPETENCES</b>  1. He/she establishes a new traditional orchard on his/her own and cares for it during the first years.		

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CARE & MANAGEMENT		Unit 3.1
<p style="text-align: center;"><b>Care</b></p> <p style="text-align: center;"><b>Analysing an existing traditional orchard</b></p>		L 4
<p><b>KNOWLEDGE</b></p> <p><b>He/she is able to</b></p> <ol style="list-style-type: none"> <li>1. describe conditions of fruit trees (size, variety, age, density of crown, etc.)</li> <li>2. describe conditions of the grassland (grazing, mowing, etc.)</li> <li>3. explain basics in phytopathology</li> <li>4. analyse biodiversity</li> <li>5. describe soil and climate condition of the orchard</li> <li>6. describe equipment and machinery</li> <li>7. explain all relevant measures of care and management measures</li> <li>8. analyse the costs of staff, material, machines and external services</li> <li>9. provide an overview on basic literature on care and management of traditional orchards</li> </ol>	<p><b>SKILLS</b></p> <p><b>He/she is able to</b></p> <ol style="list-style-type: none"> <li>1. recognise all relevant site factors and needs for care and management</li> <li>2. assess the care and management demands of each single tree in an orchard</li> <li>3. plan the costs for care and management of an existing orchard</li> <li>4. find literature according to upcoming questions and to conduct a desk research to find solutions for upcoming questions</li> <li>5. to define the production goal (especially economic orientation)</li> </ol>	
<p><b>COMPETENCES</b></p> <ol style="list-style-type: none"> <li>1. He/she analyses the conditions within an existing traditional orchard and plans actions to increase the economic value and biodiversity.</li> <li>2. He/she develops a care and management plan (including schedule and cost plan).</li> <li>3. He/she sets up a rejuvenation strategy for an existing traditional orchard.</li> </ol>		

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CARE & MANAGEMENT		Unit 3.2
<p style="text-align: center;"><b>Care</b></p> <p style="text-align: center;"><b>Implementing care and management for an existing orchard</b></p>		L 4
<p><b>KNOWLEDGE</b></p> <p><b>He/she is able to</b></p> <ol style="list-style-type: none"> <li>7. describe the use of specific tools and machines to care for a traditional orchard</li> <li>8. determine the personal equipment for protection and safety conditions</li> <li>9. explain how to maintain standard trees by regular forming and pruning</li> <li>10. describe the principles of fertilization and irrigation</li> <li>11. explain how to prevent damages by domestic or wild animals</li> <li>12. explain how to maintain grassland</li> <li>13. explain how to protect the wildlife</li> <li>14. explain how to maintain infrastructure (fences, driveways, etc.)</li> </ol>	<p><b>SKILLS</b></p> <p><b>He/she is able to</b></p> <ol style="list-style-type: none"> <li>1. implement and conduct a care plan</li> <li>2. choose and use the appropriate equipment and methods for care and management</li> <li>3. prune, form, fertilize, irrigate and protect orchard trees to keep their vitality</li> <li>4. maintain the standard trees, the grassland, the infrastructure</li> <li>5. to reach the production goal (economic and ecological orientation)</li> </ol>	
<p><b>COMPETENCES</b></p> <ol style="list-style-type: none"> <li>1. He/she manages and cares for an existing orchard on his/her own.</li> <li>2. He/she uses a business plan and does controlling to achieve an economic benefit from the orchard.</li> <li>3. He/she guarantees ecological benefits for all creatures and habitats involved.</li> </ol>		

**Propagating fruit trees for traditional orchards**

L 3

**KNOWLEDGE****He/she is able to**

1. understand and provide the definition and methods of propagation
2. describe techniques of propagation from seeds, grafts, cuttings, wildlings / root suckers
3. describe features of plant material
4. determine the tools for propagation
5. describe the care for young trees in nurseries
6. explain the details of correct labelling

**SKILLS****He/she is able to**

1. use propagation methods correctly
2. use propagation tools and materials correctly
3. take care for young trees in nurseries
4. do the labelling of the products according to legal requirements

**COMPETENCE**

1. He/she propagates fruit trees on his/her own.

**Propagating fruit trees for traditional orchards**

L 4

**KNOWLEDGE****He/she is able to**

1. understand and provide the definition and methods of propagation
2. explain techniques of propagation from:
  - a) seeds (sexual reproduction, origin of the seeds, seed dormancy, seeding technology)
  - b) grafts (copulation, budding, rootstock, grafting scion)
  - c) cuttings
  - d) wildlings / root suckers
3. describe features of plant material
4. analyse the tools for propagation
5. explain the care for young trees in nurseries
6. explain the documentation and labelling
7. analyse the costs of staff, material, machines and external services

**SKILLS****He/she is able to**

1. choose and use appropriate methods to ensure successful propagation
2. choose and to use appropriate tools and materials to ensure successful propagation
3. take care for young trees in nurseries
4. do documentation and labelling according to legal requirements
5. do calculation of costs

**COMPETENCES**

1. He/she propagates fruit trees according to traditional methods on his/her own.
2. He/she calculates and documents propagation of traditional fruit trees on his/her own.

**Propagating fruit trees for traditional orchards**

L 5

**KNOWLEDGE****He/she is able to**

1. provide and explain the definition and methods of propagation
2. explain techniques of propagation from:
  - a) seeds (sexual reproduction, origin of the seeds, seed dormancy, seeding technology)
  - b) grafts (copulation, budding, rootstock, grafting scion)
  - c) cuttings
  - d) wildlings / root suckers
3. explain features of plant material
4. describe the tools for propagation
5. explain the care for young trees in nurseries
6. explain the documentation and labelling
7. explain the biological background of vegetative propagation
8. provide an overview and estimate the costs of staff, material, machines and external services

**SKILLS****He/she is able to**

1. choose and use appropriate methods to ensure successful propagation
2. choose and to use appropriate tools and materials methods to ensure successful propagation
3. take care for young trees in nurseries
4. organize the work of propagation
5. supervise other persons working in a nursery
6. inform himself/herself about the latest legal regulations and to do documentation, labelling according to that
7. find information on varieties sought-after by customers
8. plan the assortment of varieties offered by a nursery
9. do the calculation of costs/benefits

**COMPETENCES**

1. He/she propagates fruit trees according to traditional methods on his/her own.
2. He/she can take responsibility for calculating and documenting propagation of traditional fruit trees.
3. He/she gives/takes advice on suitable/sought-after varieties to/from people working in pomology, fruit processing and marketing.

**Harvesting and storing fruit**

L 4

**KNOWLEDGE****He/she is able to**

1. describe the stages of maturity
2. explain methods of harvesting (by hand/machine)
3. analyse quality and suitability of fruits (dessert fruit, fruit for juice production, etc.)
4. explain methods of storage (conditions, tools, hygienic requirements)
5. describe the quality change of fruits during the storage
6. describe storage diseases
7. analyse the costs of staff, material, machines and external services

**SKILLS****He/she is able to**

1. choose and apply the suitable method of harvesting
2. to sort fruits according to intended use
3. choose and apply the method of storage
4. identify storage diseases
5. do documentation and calculation of costs

**COMPETENCES**

1. He/she organises and conducts harvesting and fruit storage on his/her own.
2. He/she guarantees fruit quality and does documentation and calculation on his/her own.



## Getting clear with the official requirements for running a processing company

L 4

**KNOWLEDGE****He/she is able to**

1. describe basics of legal and formal demands
  - a) legalization of the production in general
  - b) required documents for legalization (or helpful advisors)
  - c) required permissions for sale (on farm or in shops)
  - d) taxes and charges
  - e) trademarks
  - f) control institutions
  - g) correct labelling
2. describe hygienic demands
  - a) principles of Good Hygienic Practice
  - b) principles of Good Manufacturing Practice
  - c) principles of HACCP-concept including the different types of risks in processing (physical, chemical and microbiological hazards)
  - d) equipment
  - e) controlling institutions
  - f) administrative requirements - product verification
3. explain marketing of products from traditional orchards
  - a) consumer target groups
  - b) packaging and labelling
  - c) visual aspects
  - d) most important ways of distribution
  - e) product advertising
    - direct
    - internet
    - on the product
  - a) promotion on season and diversity
  - b) (social) networking
  - c) choice of market
4. describe related costs
5. provide information related to taxes
6. describe financial requirements

**SKILLS****He/she is able to**

1. search for information to put the product on the market according to official demands (ingredients, packaging, labelling)
2. acquire a product accreditation
3. comply with the rules of hygienic processing
4. keep the records necessary
5. operate machinery and equipment according to the rules of good hygienic practise
6. identify and prevent hygienic hazards
7. estimate risks for product quality and human health
8. do costing, accounting and controlling (calculate fees and taxes, calculate production costs, calculate operating resources, calculate employees costs, calculate marketing costs, calculate logistics)
9. implement successful marketing in cooperation with a marketing agency:
  - a) get information on the regional market for products from traditional orchards
  - b) find information about new products and packaging in order to implement successful marketing
  - c) address the different ways of distribution and estimate the associated benefits marketing and distribution (economical concepts)
  - d) find new customer groups

**COMPETENCES**

1. He/she can work in fruit processing according to legal (and formal) demands.
2. He/she complies with requirements of marketing, business management and hygiene in fruit processing.

## PROCESSING &amp; MARKETING

Unit 7

**Producing fruit juice**

L 3

**KNOWLEDGE****He/she is able to**

1. explain the impact of variety and harvest date on the quantity and quality of the juice
2. describe the most important requirements on room, equipment and procedure necessary for juice production (mashing, squeezing, clarification, pasteurization)
3. explain methods and recipes of juice production
4. analyse the general techniques of juice conservation
5. explain hot filling technology
6. describe the demands of labelling fruit juice

**SKILLS****He/she is able to**

1. give basic information about the composition of the juice
2. choose suitable fruit species and varieties for juice production
3. define the perfect harvesting date
4. discard unusable fruits
5. use machines correctly
6. apply given recipes and adapt them if necessary

**COMPETENCES**

1. He/she produces fruit juice autonomously with a given recipe and method.
2. He/she applies given technology for fruit juice production.
3. He/she autonomously realizes main hazards in juice production.

## PROCESSING &amp; MARKETING

Unit 7

**Producing fruit juice**

L 4

**KNOWLEDGE****He/she is able to**

1. describe ingredients and nutritive value of fruits and fruit juice (from old varieties)
2. explain changes of compounds while processing
3. explain the impact of variety and harvest date on the quantity and quality of fruit juice
4. determine the most important requirements on room, equipment and procedure necessary for juice production (mashing, squeezing, clarification, pasteurization)
5. explain methods and recipes of juice production
6. determine the most important microorganisms for juice production
7. explain the principles of microorganism-growth and -prevention
8. describe the general techniques of juice conservation
9. explain hot filling technology
10. analyse the demands of labelling fruit juice

**SKILLS****He/she is able to**

1. give basic information about the composition of the juice
2. explain the nutritional and dietary properties of fruit
3. choose suitable fruit species and varieties for juice production
4. define the perfect harvesting date
5. discard unusable fruits
6. choose the appropriate method and machines for fruit juice production
7. use machines correctly
8. apply given recipes and adapt them if necessary
9. find further information about machines and equipment (research)
10. choose appropriate conservation methods

**COMPETENCES**

1. He/she produces fruit juice autonomously and on own responsibility with a given or a varied recipe and method.
2. He/she selects and applies appropriate technology to fruit juice production.
3. He/she autonomously realizes hazards in juice production and takes measures against these hazards if necessary.

## PROCESSING &amp; MARKETING

Unit 7

**Producing fruit juice**

L 5

**KNOWLEDGE****He/she is able to**

1. explain comprehensively all relevant steps of fruit juice production (ingredients, nutritive value, equipment, methods, microorganisms, conservation, filling, labelling, etc.)
2. explain the relationship and the necessity of pomological know-how and influences of care and management on fruit juice production

**SKILLS****He/she is able to**

1. provide full information about the composition of the juice (knowledge)
2. apply nutritional and dietary properties according to the health claims on the label
3. manage all aspects of a fruit juice producing company
4. create and develop new products and/or recipes for products

**COMPETENCES**

1. He/she runs a fruit juice producing company on his/her own responsibility and creates new products.
2. He/she gives advice on suitable varieties to people working in care and management.
3. He/she gives advice on suitable varieties to pomologists.

**Producing dried fruit**

L 4

**KNOWLEDGE****He/she is able to**

1. describe compounds and nutritive value of fresh and dried fruit (from old varieties)
2. explain changes of compounds during processing
3. explain impact of variety and harvesting date on dried fruit
4. describe ways of fruit preparation for drying
5. explain methods of dried fruit production
6. characterize machinery and equipment necessary for the dried fruit production
7. define temperature range for desiccation
8. explain influence of drying on shelf life
9. characterize most important microorganism spoiling dried fruit
10. explain importance of vacuum-packing of dried fruit
11. describe correct labelling of dried fruit

**SKILLS****He/she is able to**

1. give basic information about the ingredients of dried fruit
2. explain the nutritional and dietary properties of dried fruit
3. choose suitable fruit species and varieties for dried fruit production
4. discard unusable fruits
5. prepare fruits for drying
6. select the appropriate drying method
7. use machines correctly
8. adjust the temperature in the drying machine
9. define the end of drying
10. find further information about machines and equipment (research)

**COMPETENCES**

1. He/she takes responsibility for production of dried fruit.
2. He/she manages the production of dried fruit autonomously with a given or a varied recipe and method.
3. He/she autonomously realizes main hazards in dried fruit production and copes with these hazards.

**KNOWLEDGE****He/she is able to**

1. describe most important compounds of fruits
2. analyse different types of alcohol from fruits
3. explain the impact of variety, quality and harvesting date on the quality of brandy
4. describe the most important requirements on room and equipment necessary for brandy production (fruit mills, tanks, distilling machines, etc.)
5. explain the effects of different mash additives
6. determine the most important microorganisms for mash/brandy production
7. explain the principles of microorganism growth and prevention
8. explain the need of fractionating while distilling
9. analyse the principles of diluting
10. describe the demands of labelling fruit brandy

**SKILLS****He/she is able to**

1. distinguish different types of brandy
2. select and use suitable methods and technology for producing fruit brandy
3. choose suitable fruit species and varieties for brandy production
4. define the perfect harvesting date
5. discard unusable fruits
6. choose the appropriate method and machines for brandy production
7. use machines correctly
8. add mash additives necessary
9. avoid growth of spoiling microorganisms
10. cut off heads and tails
11. dilute the heart-fraction to drinking strength
12. find further information about machines and equipment

**COMPETENCES**

1. He/she produces brandy autonomously and on own responsibility with given machinery and technology.
2. He/she autonomously realizes main hazards in brandy production and copes with these hazards.