



Food and Agriculture Organization  
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Accelerated vocational training in agriculture  
curriculum of module on  
fruit production: apple



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## **Acknowledgments**

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This curriculum was formed within the framework of the accelerated agricultural technical and vocational training for youth from 14 to 25 years (Lebanese and non-Lebanese) within the framework of the Food and Agriculture Organization of the United Nations (FAO) project "Upgrading the technical agriculture education system in Lebanon", funded by the Kingdom of the Netherlands. The training was implemented by the schoolteachers, trainers and Association of Volunteers in International Service (AVSI).

This project, led by FAO is implemented in cooperation with the Ministry of Agriculture, United Nations International Children's Emergency Fund (UNICEF), International Labour Organization (ILO), AVSI and WARD. It aims to upgrade the management and services of the agricultural technical schools of the Ministry of Agriculture in a sustainable manner to provide high-quality agricultural technical training to Lebanese and Syrian youth for increasing their employability skills. It also aims to review and update the Agriculture Baccalaureat Technique (BT) program and curricula following competency based training (CBT) and labour market needs along reviewing and updating its related institutional arrangement.

It further aims at building linkages for agricultural technical schools with private sector and setting contractual arrangement for work based learning. Also, it seeks to provide a healthy and protective learning environment for youth growth and development through the rehabilitation of school buildings and equipping school laboratories field demonstrations.

A student text book is developed for this curriculum (in Arabic)

## **Introduction**

**Unit: fruit production-apple                      duration: 40 hours**

Apple farming in Lebanon is an important crops in mountainous areas, as the nature of the climate, from a sunny day to a cold night, helps to produce distinctive fruits in terms of flavor and quality.

Lebanon's temperate climate, rich soil and abundant water resources provide key enabling factors for the region to emerge as an ideal location for agricultural activity.

Agriculture in Lebanon is one of the most vulnerable to climate change due to the misuse of available water and land resources and the pressure exerted by population growth and urbanization. Lebanon is characterized by a highly variable climatic range due to its complex topography that varies from one region to another, which leads to a great diversity of vegetation cover and agricultural products.

Cultivated area: The total cultivated area of apples is about 11 526 ha according to FAO estimates for 2011. The average farm size is less than one hectare, and apple farmers suffer many problems in the production and selling process.

## **Educational guidelines**

Accelerated vocational training is based on the principle of free, participatory and constructive education. The basis of education is for the trainees to share their information (regardless of its level) and build on that after correction and focus. Trainees' experience is one of the most important pillars that helps them to appreciate themselves and to link what they learn to what is needed in the labour market. On this basis, the training strategy aims to guide trainees and help them enter into a production cycle. It also aims to change their behaviour (especially those who have dropped out of general education or who have different difficulties to prevent their active participation in society) and to ensure a sound and effective integration into the labour market. Therefore, the trainer must be careful to implement the following things/steps:

1. Focus on collaborative work in small groups.
2. Encourage trainees to discuss, dialogue and open exchange of information and experiences.
3. Respect for colleagues at work, employer, public safety laws, rules of health and environmental protection.
4. Give equal opportunities to participate.
5. Adopt the deductive method in education because it is most suitable for this type of teaching.
6. Link practical steps to theoretical steps that is, starting from practical work to concluding theories.
7. Stay away from purely technical information, simplify things, and increase experience.
8. Pay attention to each trainee individually and monitor his/her work and correct what is necessary to maintain his/her safety and the safety of his/her colleagues and his/her work.
9. To consider "class workshop" as one of the most important teaching strategies used in this field, where the reality of work is applied directly to the reality of work or similar to the reality of work, theoretical learning is not separate from the application and the processes of discovery continue.
10. Emphasize that the trainee performs the cleaning and sterilization operations with emphasis on replication with high quality.
11. Consider field training (in practice) as one of the most important learning strategies that can be adopted.
12. Individual follow-up of the trainee during and after the educational process to ensure the achievement of the procedural objectives and acquire the necessary skills as the basis for his/her work in the labour market.
13. To consider the general objectives as the basis for the work of the trainee in the labour market, so it is necessary to verify their acquisition and acquire the necessary skills through the individual follow-up of the trainee during the learning process and during field training.
14. Work to motivate trainees to learn and push them to explore, extract and apply information frequently in order to acquire the required skill and focus using different active and interactive methods. Examples: scientific observation, field visits and projects, as well as experience and practice which are considered the most important elements of training.
15. The use of multiple educational aids to facilitate the absorption process, especially films and computer programs specialized in this area or websites.

**Table 1: The competency of the units and its stages**

	texts		evaluation mechanism
competency	At the end of this unit, and when facing a problem- a situation, the trainee is able to propose a solution to this situation and through the use of integrated resources (knowledge, capacities, skills, techniques,) related to growing apples and caring for trees.		evaluation criteria of a complex situation
competency stages	14 hours At the end of the first stage of competency, and facing the situation - problem, it has a meaning for him/her, the trainee will be able to propose a solution to this situation and through the use of integrated resources linked to Apple cultivation and identification of different Apple varieties.	26 hours At the end of the second stage of competency, and facing the situation - problem, it has a meaning for him/her, the trainee will be able to propose a solution to this situation and through the use of integrated resources linked to care of apple orchard.	evaluation criteria of a complex situation

## Didactical tools

Learning by experience and class workshop contributes by enabling the trainee to acquire the skills he/she needs. Field training (in fields and farms) is one of the most reliable tools.

In addition to the above, it is important that the trainer uses various didactical tools that contribute to reduce learning difficulties and facilitate the learning process of the trainee on the other hand. In this context, it is preferable to use active instructional materials than using the passive ones, because of the nature and type of training, and in accordance with the levels of understanding and knowledge of trainees.

Some of the most important media are:

1. computer, monitor and internet;
2. television, CD player and specialized films;
3. specialized books and magazines;
4. wall paintings; and
5. various visual and digital tools and materials to facilitate the process of explaining the theoretical content in the classroom and the practical applications in the field (safety masks, gloves, pruning shears, trees, etc.).

Add to that, websites are full of films, videos and information on the subject, which we recommend to use on the one hand and encourage trainees to look at them and search them.

**Table 2: Didactical tools and material**

Lesson	Description/ specification	Quantity for each school	Unit
2-3	Long rubber Gloves	26 pairs ( 1pair/student + 1 pair/ teacher)	Pairs
1-2-3	Safety shoes	Each student	Pairs
1-2-3	Protective hat	Each student	Pieces
1-2-3	Protective glasses	Each student	Pieces
1-2-3	Protective paws	Each student	Pairs
1-2-3	Respirators	Each student	Pieces
1-2-3	Protection dress	Each student	Pieces
2	Pruning shears	26 pcs ( 1pc/student + 1pc/ teacher)	Pieces
2	Disposable nylon boot cover	26 pairs ( 1pair/student + 1 pair/ teacher)	Pairs
1	Apple trees		Seedling
2	Narabesh Drip Irrigation + drops		Pieces
1	Visit a traditional grove	1	Visit
1	A field visit to the orchard of intensive agriculture	1	Visit
2	Visit an agricultural pharmacy	1	Visit
2	A field visit with the aim of lubrication	1	Visit
3	A field visit to identify diseases and pests	1	Visit

Ideal daytime training time: N/A

Time to start the session (readiness and implementation of practical applications):

September or October (preferably October).

### Evaluation of professional competencies

This curriculum is based on two pillars: specific objectives and competencies and their stages.

#### A. Evaluation of specific objectives

- true / false questions;
- matching questions (here the number of items in the second list must be greater than the number of items in the first list);
- fill in the blank questions;
- multiple choice questions;
- exercises; and
- follow specific implementation stages.

#### B. Competency and its stages evaluation:

The formative and corrective function of the evaluation is the most important central function, as it allows to valuing achievement and discover the learning difficulties to address them and correct the course of learning through feedback. It also seeks to develop of the higher thinking skills, especially the skill of self-assessment and critical sense and mutual evaluation among trainees, which develop their sense of responsibility. Because the measurement of the development of higher thinking skills can only be achieved by solving the problem of a complex problem or carrying out a complex task<sup>1</sup> in which a number of factors overlap, the trainee is linked, coordinated and separated. Therefore, it is essential that the complex situation be characterized by the following components and characteristics:



## Complex situation components:

- Context describing the environment in which the situation takes place.
- Document which is a set of physical, hypothesis or real elements provided to the student: text, pictures, drawings, and so on. To be used in resolving the situation, the document contains information that may be complete or incomplete, both basic and non-essential.
- The function that determines the purpose of production required, a social function.
- Instruction: A set of work instructions that are explicitly given to the student, which is a translation of the task to be accomplished.

## Complex situation properties<sup>1</sup>:

The complex situation should be:

- appropriate for any target efficiency;
- specialized resource that employs resources; and
- motivating the trainee, meaning that it raises his/her interests.

The standardized evaluation is ideal for verifying the extent to which a trainee acquires competencies and their stages through a complex situation or a complex task. The criteria adopted in this approach are:

- Relevance of the learner's product: meaning match of the production of the trainee with instructions for the task required of the trainee to do, regardless of whether the production is true or not. Did the trainee answer what he/she asked for? Was the answer within or beyond the subject? And so on. In other words, the trainee's understanding of the situation in general and of instruction in particular. If the instruction, as it is supposed to be, is composed of a complex procedural act and a cognitive content, the answer is appropriate if procedural action and cognitive content are taken into account.
- Proper use of the tools of the material: the use of concepts, theories and knowledge relating to the question properly.
- Coherence in answers, arguments, and intellectual context. The logical sequence in a trainee's product, the coherence of ideas, and the unit of meaning in a product. Is the answer logical, reasonable, acceptable, or likely to be, even if it is wrong? Is there a contradiction in the trainee's answer? And so on.

## Box 1: First phase of competency

### First phase of competency (14 hours)

At the end of the first stage of competency, and when facing the situation - problem, it has a meaning for him/her, the trainee will be able to propose a solution to this situation and through the use of integrated resources linked to Apple cultivation and identification of different varieties.

## Chapter 1: Apple cultivation: characteristics and varieties (14 hours)

**Specific objectives:** at the end of this chapter, the trainee will be able to:

1. discover apple varieties;
2. compare characteristics of apple varieties;
3. identify the rootstocks of apples;
4. recognize the intensive breeding of apples;
5. distinguish between traditional and intensive cultivation of apples;
6. calculate the number of trees according to the area of the land; and
7. determine the characteristics of apple varieties by geographic area.

### Theoretical content:

1. the optimal environmental requirements for growing apples;
2. criteria for selection of apple variety and rootstock;
3. characteristics of rootstocks most planted in Lebanon;
4. main Apple varieties (yellow, red, green ...) in Lebanon;
5. the process of calculating the number of trees and the distance between trees and between rows; and

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<sup>1</sup> Complex and not complicated: "complex" means that the trainee has all the resources necessary for the solution, and only has to coordinate and connect with each other\* to accomplish the solution or task while "complicated" means that resources have not yet been acquired by the trainee

- intensive cultivation and its importance.

**Practical content:**

- Exercise 1: show picture of intensive farming.  
Exercise 2: field visit to a traditional apple orchard.  
Exercise 3: field visit to the intensive cultivation farm.

**Box 2: Second stage of competency (16 hours)**

**Second stage of competency (16 hours)**

At the end of the second stage of competency, and when facing a situation - problem, it is meaningful for him/her, the trainee will be able to propose a solution to this situation and through the use of integrated resources linked to care of apple orchard.

**Chapter 2: Apple orchard cultivation practices (8 hours)**

**Specific objectives:** at the end of this chapter the trainee will be able to:

- determine suitable soil characteristics for apple cultivation;
- plant apples seedling;
- control weed in appropriate ways;
- practice various methods of irrigation;
- perform fertilization program;
- differentiate the characteristics of organic and chemical fertilization;
- recognize symptoms of nutrients deficiency;
- recognize the importance of using fertigation;
- perform pruning; and
- perform fruit thinning.

**Theoretical content:**

- soil preparation and soil sampling;
- planting method and most common farming systems;
- weed control;
- irrigation methods (traditional, drip, sprayer);
- fertilization: the importance of Oligo and micro elements;
- fertilization plan;
- organic fertilization and its importance;
- symptoms of nutrients deficiency;
- fertigation;
- winter pruning and summer Pruning, timing, importance and method of implementation;
- pruning forms; and
- fruit thinning and its importance.

**Practical content:**

- Exercise 1: show presentation on the method of soil sampling.  
Exercise 2: show presentation on the method of planting.  
Exercise 3: taking soil samples and planting apples seedling.  
Exercise 4: a visit to the apple orchard to learn about the forms of growing apple tree.  
Exercise 5: identification of forms and types of fertilizers.

**Chapter 3: Diseases and pests and control practices (8 hours)**

**Specific objectives:** at the end of this chapter the trainee will be able to:

- identify methods of prevention from pest and diseases;
- identify diseases and pests on apples;
- control diseases and pest according to the official's instructions; and
- recognize the calendar of good agricultural practices.

**Theoretical content:**

1. methods and basics of pest prevention - intervention period - field control;
2. definition of integrated pest management;
3. the most important pests and diseases: symptoms, prevention and methods of control; and
4. good Agricultural Practices Calendar.

**Practical content:**

Exercise 1: show presentation of some diseases, pests and methods of control.

Exercise 2: field visit to the apple orchard.



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Ministry of Agriculture



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