



Food and Agriculture Organization
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Accelerated vocational training in agriculture
curriculum of module on
field crop production: potato



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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 implement by the schoolteachers, trainers and AVSI.

This project, led by FAO is implemented in cooperation with the Ministry of Agriculture, United Nations International Children's Emergency Fund (UNICEF), 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: field crop production potato duration: 40 hours

The approach of this unit is a reference framework that links practical application with theoretical information in an integrative manner. The trainee will be able to identify potato varieties and the appropriate nutrients needed for production in addition to the implementation of soil preparation, fertilization, planting, pest control, weeding, harvesting, packaging and storage.

Educational guidelines

Accelerated vocational training is based on the principle of free participatory and constructive education. The basis of education is that trainees share their information with each other (no matter what level they are) and build upon them after correction. 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 applied work to the conclusion of 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 facing a problem-situation, the trainee will be able to propose a solution to this situation and through the use of integrated resources (knowledge, capacities, skills, techniques...) related to Potato cultivation, caring, harvesting and packaging.			evaluation criteria of a complex situation
competency stages	10 hours At the end of the first stage of competency, and facing a problem-situation, 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 the potato varieties and preparing potato tubers for plantation.	20 hours At the end of the second stage of competency, and facing a problem-situation, 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 planting potato.	10 hours At the end of the last stage of competency, and facing a problem-situation, 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 the potato harvesting and packaging.	evaluation criteria of a complex situation

Didactical tools

Learning by experience and class workshop contributes by enabling the trainee to acquire the skills he 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 reducing the burden on him/her 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 one because of the nature and type of training and in proportion to the levels 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 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

Unit	Quantity for each school	Description/ specification	Lesson
Pieces	Each trainee	Rubber gloves	1-2-3-4
Pieces	Each trainee	Agriculture gloves	1-2-3-4
Pieces	Each trainee	Protective goggles / glasses	1-2-3-4
Pieces	Each trainee	Rubber boots	1-2-3-4
Pieces	Each trainee	Mask	1-2-3-4
Pieces	Each trainee	Coveralls	1-2-3-4
Pieces	5	Shovel with a long wooden handle	2
Pieces	6	Pickaxe with a long wooden handle	2
Pieces	5	Hoe with a long wooden handle	2
Pieces	2	Wheel barrow	2
Pieces	2	Fork Hoe with a long wooden handle	2
Pieces	2	Rake	2
Pieces	5	Garden hand hoe with 3 teeth + pickaxes	2
Bags	2	Slow release fertilizer	3-4
Pieces	2	Organic fertilizer	3-4
Pieces	1	Weather thermometer	3
Pieces	1	Weather hygrometer	3
Pieces	1	Knapsack sprayer 20 liter	2-3
Pieces	1	Tensiometer (soil moisture sensor) + Auger	3
Unit	5	Insect sticky trap	3

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

Akkar region: from February to June

Bekaa region: from April to September

Ideal daytime training time: N/A

Evaluation of professional competencies

This curriculum is based on two pillars: specific objectives, 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 task¹ 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 properties¹

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/her asked for? Was the answer within or beyond the subject? 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? So on.

Box 1: First phase of competency

First phase of competency (10 hours)

At the end of the first stage of competency, and facing a problem-situation, 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 the potato varieties and preparing potato tubers for plantation.

Chapter 1: Potato varieties and potato tubers preparation (10 hours)

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

1. show scientific classification of potatoes;
2. determine suitable climatic conditions for cultivation of different potato varieties;
3. discover parts of the potato plant;
4. distinguish the different varieties of potatoes grown in Lebanon; and
5. prepare potato tubers for plantation.

Theoretical content:

1. general information;
2. an overview of potato cultivation in Lebanon;
3. scientific classification of potatoes;
4. favorable Climatic conditions for potato cultivation:
 - climate requirements; and
 - season's time and areas of cultivation.
5. potato morphology; and

¹ 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

6. selection of potato tubers and preparation for planting:
 - variety selection;
 - suggested varieties;
 - the quality of potato tubers and their sources;
 - control of tuber pests;
 - potato tuber storage conditions; and
 - treat tubers before planting.

Practical content:

Exercise 1: drawing potato plant parts

Exercise 2: potato varieties.

Exercise 3: cut and treat potatoes tubers in preparation for planting.

Box 2: Second stage of competency

Second stage of competency (20 hours)

At the end of the second stage of competency, and facing a problem-situation, 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 planting potato.

Chapter 2: Potato preparation and planting (10 hours)

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

1. choose suitable soil types for potato cultivation;
2. perform all agricultural practices needed to prepare the field for potato cultivation;
3. use of various agricultural equipment necessary for potato cultivation and harvesting;
4. control Weeds before planting;
5. understand the principles and methods of implementation of the crop rotation; and
6. perform planting Potatoes according to specific criteria and standards.

Theoretical content:

1. soil preparation;
2. weed control;
3. crop rotation; and
4. potato cultivation.

Practical content:

Exercise 1: agricultural practices in potato cultivation.

Exercise 2: agricultural equipment used in potato cultivation.

Exercise 3: the crop rotation

Chapter 3: Potato crop management (10 hours)

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

1. apply post fertilization program according to the instructions of the supervisor;
2. perform the bedding up process;
3. perform irrigation of potatoes in quantities and appropriate ways;
4. identify the diseases and weeds that affect potato tubers; and
5. perform control of diseases affecting the potato tubers.

Theoretical content:

- 1- fertilization:
 - Crop nutrients requirements.
 - Fertilization requirements.
 - Fertigation.
- 2- bedding up;
- 3- irrigation and using new techniques;
- 4- integrated pest management (IPM); and
- 5- prevention and control of pests and diseases:
 - Insects.
 - Fungal diseases.

- Bacterial diseases.
- Viral and viroid diseases.
- Nematodes.

Practical content:

Exercise 1: soil analysis and calculation of the amount of fertilization.

Exercise 2: integrated pest management.

Exercise 3: types of insect traps.

Exercise 4: types of pests and symptoms of infection.

Exercise 5: preparation and use of pesticides.

Box 3: Third phase of competency

Third phase of competency (10 hours)

At the end of this phase and facing a problem- situation, the trainee will be able to propose a solution to this situation by using it in a combination of resources related to the potato harvesting and packaging.

Chapter 4: Harvesting (10 hours)

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

1. determine the proper harvest time and method;
2. perform the transfer of potatoes from the field to the packing house;
3. perform using of various appropriate methods for packing and storing potatoes; and
4. calculate the cost of potato production per Dunum.

Theoretical content:

1. harvesting:
 - harvest time;
 - Pre-harvest operations; and
 - harvest.
2. Packaging;
3. Storing; and
4. the cost of potato production per Dunum.

Practical content:

Exercise 1: harvesting.

Exercise 2: packaging.

Exercise 3: storing.



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