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Accelerated vocational training in agriculture curriculum of module on leafy green vegetable production: lettuce



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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 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 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 textbook is developed for this curriculum (in Arabic)

Introduction

Unit: Leafy green vegetables-lettuce production duration: 40 hours

The leafy green vegetables consist of a many varieties such as lettuce in its different types and forms, spinach, dandelion. 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 the types of leafy vegetables and the appropriate nutrients for their production. Fertilization, planting, insect and weed control, harvesting, packaging and storage operations.

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 when facing a problem-a 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 lettuce cultivation, care, harvest and postharvest.			evaluation criteria of a complex situation
competency stages	12 hours At the end of the first stage of competency, and when facing a problem- a 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 general characteristics of leafy green vegetables including all lettuce types.	16 hours At the end of the second stage of competency, and when facing a problem- a 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 cultivation practices and soil preparation for lettuce plantation.	12 hours At the end of the third stage of competency, and when facing a problem- a 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 all agricultural practices needed to grow lettuce, harvesting and packaging.	evaluation criteria of a complex situation

Didactical tools

Learning by experience and class workshop contributes to 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

unit	quantity for each school	description/ specification	lesson
Pieces	Each student	Rubber gloves	1-2-3-4
Pieces	Each student	Agriculture gloves	1-2-3-4
Pieces	Each student	Protective goggles / glasses	1-2-3-4
Pieces	Each student	Rubber boots	1-2-3-4
Pieces	Each student	Mask	1-2-3-4
Pieces	Each student	Coverall	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	2
Bags	2	Organic fertilizer	2
Piece	1	Weather thermometer	2-3
Piece	1	Weather hygrometer	2-3
Piece	30	Seed tray	2
Piece	1	Knapsack sprayer 20 liter	3
Piece	1	Tensiometer (soil moisture sensor) + Auger	2-3
Bag	1	Lettuce seed	2
seedling	200	Lettuce seedling	2
Bags	2	Tourbe	2
Bags	2	Peat moss	2

Ideal daytime training time: N/A

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

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 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 components¹:

- 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, 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:

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? 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 (12 hours)

At the end of the first stage of competency, and when facing a problem- a 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 general characteristics of leafy green vegetables including all lettuce types.

Chapter 1: General introduction on leafy green vegetables (12 hours)

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

1. determine the types of leafy green vegetables;
2. list the nutritional values of lettuce;
3. determine the properties of the most important varieties of lettuce cultivated in Lebanon; and
4. determine the characteristics of suitable agricultural areas for growing lettuce according to seasons and climate.

Theoretical content:

1. general information;
2. food properties of lettuce;
3. characteristics of the most important varieties of lettuce cultivated in Lebanon; and
4. the appropriate climate for growing lettuce.

Practical content:

Exercise 1: discuss different types of leafy green vegetables and distinguish each species.

Exercise 2: the most important varieties of lettuce cultivated in Lebanon.

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

Box 2: Second stage of competency

Second stage of competency (16 hours)

At the end of the second stage of competency, and when facing a problem-a situation, it is meaningful for him/her, the trainee is able to propose a solution to this situation and through the use of integrated resources linked to the cultivation practices and soil preparation for lettuce plantation.

Chapter 2: Preparation and cultivation of lettuce (16 hours)

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

1. choose the appropriate seeds to grow lettuce;
2. determine the appropriate soil types to grow lettuce;
3. perform the various field works used to prepare the land for the cultivation of lettuce;
4. plant lettuce seeds in nursery and field according to approved standards and norms; and
5. detect the importance of hydroponics lettuce production

Theoretical content:

1. select seeds;
2. choose soil type; and
3. methods of growing lettuce:
 - In the nursery;
 - In the field;
 - Plant density;
 - Plastic row cover for lettuce;
 - Modern methods of growing lettuce.

Practical content:

Exercise 1: carrying out field work in the cultivation of leafy vegetables.

Exercise 2: identification of agricultural equipment used in the cultivation of leafy vegetables.

Exercise 3: field visit to aquaculture farm.

Box 3: Third phase of competency

Third phase of competency (12 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 all agricultural practices needed to grow lettuce, harvesting and packaging.

Chapter 3: Care of grown lettuce (8 hours)

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

1. perform the process of thinning;
2. apply fertilization program according to the supervisor instructions;
3. perform irrigation program according to quantities, species, season and climate;
4. implement the principles of the crop rotation;
5. identify the types of diseases that affect lettuce;
6. control insects and diseases that affect lettuce; and
7. use the appropriate pesticides according to instructions and under the supervision of an agricultural engineer.

Theoretical content:

- 1- thinning;
- 2- fertilization;
- 3- irrigation;
- 4- crop rotation;
- 5- control measures; and
- 6- pests and control measures:
 - Insects;
 - Fungal diseases;
 - Bacterial diseases;
 - Viral diseases;
 - Nematodes.

Practical content:

Exercise 1: field visit to carry out various agricultural operations of thinning, fertilization, irrigation...).

Exercise 2: preventive practices and pest control.

Chapter 4: lettuce harvesting and packaging (4 hours)

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

1. determine the timing and method of harvesting lettuce;
2. apply good packaging and storing method; and
3. calculate the cost of lettuce production per Dunum.

Theoretical content:

1. harvesting;
2. packing;
3. cooling and storage; and
4. calculation of the cost of lettuce production per Dunum.

Practical content:

Exercise 1: implementation of harvesting.

Exercise 2: implementation of the packaging process.



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