



# JAPANESE GRANT AID PROJECT



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### The Government Of Japan Extended Its Grant To The Government Of Syrian Arab Republic ( General Organization For Seed Multiplication )

The first step for this project was set in 1997. The Japanese team nominated by Japan International Cooperation Agency ( JICA ) had started their basic design study in the collaboration with the Syrian local team in July 2000.

- ↪ **Project title:** The Project for Improvement of Seed Multiplication capacity in Syrian Arab Republic.
- ↪ **Project phases:** The project consists of two phases:
  - Phase I :** The equipment and the installation work for seed processing plant as to cover the demands of the farmers in Aleppo and Edlep provinces as well as equipment for seed quality tests at J¥ / 478 000 000 / equivalent to / 4 / million US\$ . It was inaugurated in July 2002.
  - Phase II:** The equipment and the installation work for tissue culture laboratories and modern greenhouse at 3000 m<sup>2</sup> as well as quality control room ( a green house 300 at m<sup>2</sup> ). That is to achieve the superior stages of production in local seed potatoes production project. Also to partially cover the country's demand of these seeds aiming to get rid of importation in the future. It is at J¥/ 455 000 000 / equivalent to / 4 / million US \$ .
- ↪ **Amount of donation:** It is at J¥ / 455 000 000 / equivalent to about / 4 / million US\$ .
- ↪ **The project site:** Al Billeqramoon Village – Aleppo province.
- ↪ **The site area:** / 10 / hct.
- ↪ **The area of tissue culture laboratories, green house and annexes:** /4.75/hct.

↳ **Beneficiary and supervision:** General Organization For Seed Multiplication .

↳ **The Japanese Consultants Company:** System Science Consultants Inc. (SSC).

↳ **Implementing Company:** Sumitomo Corporation.

↳ **The components of the contract of phase II:**

1. Supplying of lab Equipments for tissue culture laboratories and viral tests.
2. Supplying of complete equipments for the green house at 3000 m<sup>2</sup> for the production of super classes of seed potatoes.
3. Supplying of complete equipments for the green house at 300 m<sup>2</sup> (quality control ) to perform the required tests for the safety/ good phytosanitary conditions of the plantlets in the main green house.

↳ **Civil and construction work of phase II:**

**Finance party :** General Organization For Seed Multiplication .

**Implementing party :**

- Al Sahel company for construction and building: Tissue culture laboratories building and general site.
- Mili housing company for the green house and its annexes civil works ( Generator room, Boiler room, main water tanks ).
- Laboratories furniture: It includes tables, benches, different closets in modern style to insure optimal position for supplied equipments, and to store glassware and others in a good suitable situation for the tissue culture laboratories work conditions.

# Tissue Culture Laboratories

Hereafter a description of the supplied equipment as situated inside the laboratories:

- 1. Washing room:** To wash the glassware in general and it includes:
  - ⇒ Ultrasonic pipette washer.
  - ⇒ Automatic glassware washing machine.
  - ⇒ Dry heat sterilize ( oven ), / 2 / units.
  - ⇒ Dry oven, / 3 / units.
- 2. Sterilizing room:** To sterilize the nutritional media by means of wet temperatures as to prepare it for cultivation in cultivation room, and its includes:
  - ⇒ Large autoclave at / 594 / L capacity.
  - ⇒ Small autoclave at / 225 / L capacity, / 2 / units.
- 3. Water purification room:** To obtain pure via De-ionized water technique, which is to be used in preparing lab media and other general lab usages. It includes:
  - ⇒ Purification water system, / 2 / units.
- 4. Nutritional media preparation room :** To prepare different solid and liquid artificial nutritional media as to suit plant growth according to its kind and to the purpose of a trial or a research. It includes:
  - ⇒ Acidity ( PH ) meter , / 2 / units.
  - ⇒ Electric conductivity ( EC ) meter.
  - ⇒ Dispenser 5 – 30 ml, / 5 / units.
  - ⇒ Electronic dispenser up to 500 ml.
  - ⇒ Automatic pipette, / 3 / sets.
  - ⇒ Magnetic stirrer, / 3 / units.
- 5. Glassware room:** It includes a huge number of glassware required in different sizes suitable for work ( test tubes, jars with lids, graduated cylinders, beakers, volumetric flasks, conical flasks, pipettes, various Petri dishes and test tubes racks/ holders ( made of stainless steel. ).
- 6. Refrigerator and incubator room :** It includes:
  - ⇒ Large refrigerator with freezer, / 3 / units.
  - ⇒ Small refrigerator with freezer, / 4 / units.

- ⇒ Illuminated incubator of electronic control of temperature, humidity and light, / 3 / units.
- ⇒ Rotary shaker of rotary and reciprocate shacking types, to shack test tubes and flasks.

**7. Balances room:** To weigh all different kinds of chemicals whatever accuracy rate is required. It includes:

- ⇒ Electrical balance of automatic calibration and adjustment, / 2 / units.
- ⇒ Analytical balance of automatic calibration and adjustment, / 2 / units.

**8. Microscope room :** To test the required tissue sections and to be used in micro – propagation. It includes:

- ⇒ Stereoscopic microscope with photo micrographic system, / 4 / units.
- ⇒ Universal microscope with photo micrographic system, / 2 / units.

**9. Culture room:** It consists of two rooms for sterilized lab cultivation where tissues and *in vitro* plants are cultivated under the laminar air flow ( full clean benches ) . it includes:

- ⇒ Sets of laminar air flow with sterilizing UV light , and others as white light ( fluorescent ), gas burner and electricity supply, / 6 / sets ( three units in each room ) .
- ⇒ Enough number of the required tools for sterilized cultivation and of different sizes ( forcipis, scissors and scalpel blades ) .

**10. Growth rooms :** They are 3 rooms prepared to incubate and to allow growth of tissues and *in vitro* plants. They provide suitable environmental conditions for the growth and development of tissues and in vitro plants, which are going to be complete plants grown under sterilized conditions. Then they become the nucleus , which would be planted in the green house. Each room includes:

- ⇒ Programmable automatic control temperature system.
- ⇒ Automatic control light system.
- ⇒ Automatic control relative humidity system.
- ⇒ Circuit protection system for abnormal and extreme conditions by light and sound alarm.
- ⇒ Lux meter, / 3 / units.
- ⇒ Air quality tester.

**11. Quality control room:** In which the rate of viral diseases in plant materials is determined. It includes:

- ⇒ Micro plate ELISA reader with a printer : by which ELISA micro plates can be read in order to detect the viral diseases.
- ⇒ Micro plate ELISA washer.
- ⇒ Micro plate ELISA incubator.
- ⇒ Multi channel ( 8 ch ) digital pipette with special tips, / 2 / units.
- ⇒ Mono channel pipette.
- ⇒ Microscope for IF test automatic photo micro camera system.
- ⇒ Illuminated incubator, / 1000 / liter capacity, of programmable electro automatic control for temperature, airflow and light . it is also equipped with circuit protection devices.
- ⇒ Fume hood.

## The Green House

It is 3240 m<sup>2</sup> of 3 equal separate rooms. It includes:

- 1. Preparatory room:** To insure the proper isolation inside the green house against external conditions . It contains stainless steel working tables with two washing sinks, to prepare the *in vitro* plantlets for planting .
- 2. Main control system:** Programmable control ( manual and automatic ) for temperature, irrigation, CO<sub>2</sub> gas rate, window operation ( ventilation ) and for over roof outer curtain and inside ceiling curtain too. It is also equipped with a recorder of environmental conditions inside the green house.
- 3. Alarm system:** The green house is equipped with automatic alarm system to temperature condition change caused by various environmental conditions variation or by the operation of inner equipment. That is through emergency light and alarm signals.
- 4. Heating system:** It includes a room for two boilers of enough capacity to heat the green house. As well as all the heating pipe lines including the fin tubes under the rolling benches and the needed pumps.
- 5. Cooling system:** It depends on pan and fan cooling type as well as it includes all pipe lines for water circulation through the ( gables ) pad walls.
- 6. Automatic curtain system:** Its type is over roof outer curtain and inside ceiling curtain with side curtain.
- 7. Drip irrigation system:** It includes dripper pump, control units, irrigation and fertilizer tanks and all required water piping. The dripper is automatic and programmable. As well as the green house is equipped with water softener of enough capacity, to provide it with a good quality of water to all equipments which needed.
- 8. Rolling bench system:** The green house is equipped with 90 rolling benches moving on special boards as to make the optimum use of the inner area of the green house. The capacity of these benches is 65 thousand plants. Moreover, the green house is equipped with light system for night work.

- 9. Spray system:** It includes: High pressure pump, water tanks, needed chemicals ( available in preparation room ), even the droppers which provides the mist irrigation and others for fog irrigation, where the mist spray irrigation, chemical treatment/ control and leaf fertilizing done in an easy and effective way.
- 10. Window system:** Automatic opening and closing system for ceiling windows and pad windows, manual opening and closing for side windows. Knowing that all windows and open points including the pad windows are covered totally with fine insect protection net resistant to UV.
- 11. CO<sub>2</sub> gas supply system:** It includes CO<sub>2</sub> gas generator, and automatic and adjustable control system, CO<sub>2</sub> gas rate meter, with all the required safety devices.
- 12. Soil sterilizer:** The green house is equipped with separate sterilizer for soil or planting / cultivation media by means of steam of 500 kg/hour capacity .
- 13. Standby generator:** The project is equipped with special generator to generate the required electrical voltage of 550 KVA capacity, in order to load and supply the green house and the growth rooms with electric power, and auto restart system in case of normal city supply power broken off, and auto stop system when the electricity broken on, through transmission and self restart control panel .



## **The Green House For Quality Control**

**It is 300 m<sup>2</sup> and divided into 8 equal rooms / compartments for all works related to the green house including quality control . Each room includes two fixed type benches. The double outside doors and all open points are covered with fine insect protection net, to insure proper isolation from external conditions.**

**It includes the control system which is as same as the main green house. It is equipped with a recorder of environmental conditions inside the green house and for external temperature and relative humidity. Automatic control for heating facility, cooling facilities, over roof curtain, drip irrigation facilities, ceiling windows and light, and manual control for inner curtain system.**

# **Annex**

## TISSUE CULTURE LABORATORIES IN AL BILLERAMOON



# TISSUE CULTURE LABORATORIES

## Washing room



➤ Ultrasonic pipette washer

➤ Automatic glassware washing machine



➤ Dry oven sterilize

## Sterilizing room



➤ Autoclaves

## Water purification room

➤ Purification water system



## Nutritional media preparation room



- **Left:** Acidity ( PH ) meter
- **Right:** Electric conductivity ( EC ) meter

- **Automatic dispensers**





➤ **Magnetic stirrer**

### Refrigerator and incubator room



➤ **Refrigerator with freezer**



➤ **Illuminated incubator of electronic control**

- **Rotary shaker**



**Balances room**



- **Electrical balance of automatic calibration**

**Microscopes room**

- **Universal microscopes with photo micrographic system**





## Culture room



- Sets of laminar air flow

## Quality control room

- **Left:** Micro plate ELISA reader
- **Right** Micro plates ELISA washer



- Microscope for IF test automatic photo micro camera system

## Growth rooms



## البيت الزجاجي



➤ Front side of the green house



➤ Back side of the green house



➤ Inside the green house

## THE GREEN HOUSE FOR QUALITY CONTROL





**GENERAL ORGANIZATION FOR SEED MULTIPLICATION**