



**AGRICULTURA**  
SECRETARÍA DE AGRICULTURA Y DESARROLLO RURAL

**inifap**  
Instituto Nacional de Investigaciones  
Forestales, Agrícolas y Pecuarias

Technical summary of the Cooperation Program for the Training of Human Resources in the Global Strategic Partnership México–Japón, Nichiboku

## **Course**

# **Conservation, micropropagation and use of native plant genetic resources with ornamental potential**



**INIFAP CIRPAS, Zacatepec Experimental Field, Morelos**

Program, Sept 22 to Sept 28, 2026

# **I. Background**

## **Course Title**

Conservation, micropropagation and use of native plant genetic resources with ornamental potential

## **Course Objectives**

Provide selected Nichiboku program fellows with scientific and technical knowledge on the various tools of plant tissue culture that can be used for the conservation, propagation and commercial use of native plant genetic resources with ornamental potential.

## **Goal**

Train human resources capable of applying the theoretical bases and techniques of *in vitro* plant tissue culture for the conservation and use of native plant genetic resources in a commercial and sustainable manner.

## **Expected results**

Upon completion of the training and technical assistance, participants will be able to understand and adopt the basic concepts and basic technical skills to apply plant tissue culture as a tool for the conservation, propagation and use of native plant genetic resources with ornamental potential and establish, in the medium and long-term, collaboration agreements for better sustainable use.

## **¿For whom it is?**

Aimed at undergraduate students in careers related to Agriculture, Biology or Biotechnology committed to the management and conservation of natural resources.

# **II. Training Course Description**

The Training Course is divided into two sections. Section I addresses

theoretically/practically the in vitro plant tissue culture methods used in ornamentals, including the preparation of stock solutions, the preparation of culture media, the stages of micropropagation and acclimatization, using different plant species and tissues. Section II also addresses theoretically/practically the use of plant genetic resources of ornamental value in a commercial and legal manner, taking into account the risk category of the species, Protected Natural Areas and tours by companies that have Environmental Management Units (EMU´s).

### **III. General Information**

#### **Course period**

September 22 to September 28, 2026.

#### **Course Delivery Location**

INIFAP CIRPAS- Zacatepec Experimental Station, located at Km 0.5 of the Zacatepec-Galeana highway, in the municipality of Zacatepec de Hidalgo, Morelos, Mexico.

#### **Language**

This training will be carried out in English language.

#### **Modality**

Classroom course

#### **Capacity (Maximum number of participants)**

4 scholarship participants

### **IV. Eligibility**

#### **1. Expectations towards participants**

For interested students they are expected to have the following skills and abilities:

- Learning: in basic concepts of micropropagation and conservation of native plant genetic resources.
- Experience: in floral biology, conservation and commercialization of natural resources.
- Skills: micropropagation techniques for native plants, from the collection of plant material to the acclimatization of plants in the greenhouse.
- Understanding of real applications: understand how native plant genetic resources are currently used in Mexico, for gardening, cut flowers, tourism, collectors, etc.
- Presentation of results: Students are expected to be able to communicate their teachings, and develop proposals in their country for the sustainable use of native plant genetic resources.

## **2. Requirements for candidates**

Interested parties must meet the following requirements:

1. Undergraduate or Postgraduate level students in careers related to Biology, Agriculture and the Conservation of Natural Resources.
2. People in charge of the Micropropagation Laboratory, Greenhouse, or Botanical Garden.
3. Age: between 18 and 35 years old.
4. Health: The candidate must be in good health, both physically and mentally, to participate in this program.
5. Language: English
6. Participants must bring a laptop and USB memory
7. Computer Skill: You will need to be proficient in MS Word, Excel, Power Point, etc.
8. Gender consideration: INIFAP promotes gender equality. The application of women to training is encouraged.

## **3. Participation Conditions**

The participants must:

1. Have the acceptance notice.
2. Strictly observe the course calendar.
3. The training will take place in the states of Mexico City and

Morelos, so it is not allowed to leave them during the course period.

4. Do not bring or invite any additional member to the registered one.
5. Respect and follow the instructions and comply with the stipulated conditions.

## **V. Information about the Training Center**

At the Zacatepec Experimental Station, Morelos, the main lines of research focus on the development of technologies and innovations for economically important crops in the region such as sugar cane, rice, corn, sorghum, amaranth, ornamental plants (poinsettia, orchids, bromeliads) forest (low deciduous forest), tomato, nopal vegetable, among others. Within its infrastructure it has the Rice Quality Analysis Laboratory, Phytopathology Laboratory, Seeds Laboratory, Microorganisms Laboratory and Plant Tissue Culture Laboratory (PTC) *in vitro*, in addition to a Seed Germplasm Bank (cold room), greenhouses and experimental field for crop evaluations.

In the PTC *in vitro* Laboratory, the main lines of research are aimed at the development of micropropagation protocols that support the conservation and use of native species with ornamental and agro-industrial potential, such as poinsettias, bromeliads, orchids, anthuriums and agaves, mainly. National and regional research projects have been carried out, and each year the training of undergraduate and graduate students is supported to develop research projects, theses and academic stays.

### **Additional important information**

1. Bring appropriate clothing for going out into the countryside (long-sleeved shirt, closed shoes or comfortable boots for walking, cap/hat, repellent, sunscreen).
2. Since the weather in Morelos at that time is hot (30-35° C), it is recommended to bring comfortable and cool clothing.
3. It is recommended to bring medications for your health/allergy care.

**SECRETARY OF AGRICULTURE AND RURAL DEVELOPMENT**

**MEXICAN AGENCY FOR INTERNATIONAL COOPERATION FOR DEVELOPMENT**

**NATIONAL INSTITUTE OF FORESTRY, AGRICULTURE AND LIVESTOCK RESEARCH (INIFAP)**

**BILATERAL COOPERATION PROJECT:**

**COOPERATION PROGRAM FOR THE TRAINING OF HUMAN RESOURCES IN THE MÉXICO-JAPAN  
GLOBAL STRATEGIC PARTNERSHIP: NOCHIBOKU PROGRAM**

**MÉXICO - JAPAN**

**TRAINING AND TECHNICAL ASSISTANCE:**

**CONSERVATION, MICROPROPAGATION AND USE OF NATIVE PLANT GENETIC  
RESOURCES WITH ORNAMENTAL POTENTIAL**

**MÉXICO - JAPAN**

**EXECUTING INSTITUTION:**

**NATIONAL INSTITUTE OF FORESTRY, AGRICULTURE AND LIVESTOCK RESEARCH (INIFAP)**

**MODALITY AND PLACE OF TRAINING:**

**Short courses Internship  
(Japan) Advisory (México)**

**PERIOD:**

**SEPTEMBER 22, 2026**

**SEPTEMBER 28, 2026**

## WORK PROGRAM

### CONSERVATION, MICROPROPAGATION AND USE OF NATIVE PLANT GENETIC RESOURCES WITH ORNAMENTAL POTENTIAL

#### INTRODUCTION

Plant genetic resources for food and agriculture (PGRFA) are the genetic diversity of plant origin with value or potential for food, ornamental or agriculture, which are a source of genes of interest that confer resistance to pests, diseases or unfavorable environmental conditions. with which varieties can be obtained through genetic improvement.

Regarding plant genetic resources of interest, in México, there are 50 anthropocentric species of interest, of which 24 belong to annual crops and

26 perennial crops. Among which are corn, beans, chili, pumpkin, cacti, vanilla, cempoalxochitl or flower of the dead, tomato, agaves and ornamentals. For the conservation of germplasm, there are several methods, among which the most notable are seed storage, *ex situ*, in botanical gardens and *in vitro* collections. The establishment of *in vitro* collections involves the conservation and propagation of unconventional germplasm such as vegetatively propagated and recalcitrant materials. Furthermore, the cultivation of plant tissues is used as a strategy for the conservation, use and exchange of genetic material. A good part of the activities related to the study, conservation and use of plant genetic resources, particularly basic crops, have been developed by INIFAP.

For an adequate study, conservation and use of the diversity of plant genetic resources, it is necessary to adequately combine the efforts of academic, official, community and international collaboration.

#### OBJECTIVE

Offer technical and scientific knowledge about the various plant tissue culture techniques that can be used for the conservation, propagation and use of native plant genetic resources with ornamental potential.

## EXPECTATIONS

Upon completion of the training and technical assistance, participants will be able to understand and adopt the basic concepts and basic technical skills to apply plant tissue culture as a tool for the conservation, propagation and use of native plant genetic resources with ornamental potential and establish, in the medium and long-term, collaboration agreements for better sustainable use.

## PARTICIPANT RESEARCHERS

NAME/E-MAIL	SPECIALTY	ADSCRIPTION	COUNTRY
<b>Dr. Sandra Eloísa Rangel Estrada</b> Researcher <a href="mailto:rangel.sandra@inifap.gob.mx">rangel.sandra@inifap.gob.mx</a>	Plant Physiology	National Institute of Forestry, Agriculture and Livestock Research (INIFAP) South Pacific Regional Research Center. Zacatepec Experimental Field.	México
Dr. Edwin Javier Barrios Gómez Researcher <a href="mailto:barrios.edwin@inifap.gob.mx">barrios.edwin@inifap.gob.mx</a>	Plant Genetic	National Institute of Forestry, Agriculture and Livestock Research (INIFAP) South Pacific Regional Research Center. Zacatepec Experimental Field.	México

## WORK PROGRAM

### COURSE TITLE

## CONSERVATION, MICROPROPAGATION AND USE OF NATIVE PLANT GENETIC RESOURCES WITH ORNAMENTAL POTENTIAL

### Section 1. Micropropagation of native plants

**Objective:** Acquire technical and scientific knowledge about the different techniques of plant tissue cultivation that can be applied in the conservation and propagation of native plant genetic resources with ornamental potential

**Didactic scope:** The session I-4 covers theoretically/practically methods of *in vitro* plant tissue culture in ornamentals, from the preparation of culture media, the five stages of micropropagation to acclimatization, using different species and plant organs. The topics aimed at undergraduate and graduate students in the areas of Agronomy, Biology and Biotechnology, focus on ornamental plants native to México and species that have been the most commercially used, such as poinsettia, orchids and agaves. At the end of the session I-4 attendees will be able to determine the methodology to develop a micropropagation protocol focused on the conservation and propagation of ornamentals; In addition, they will have the basic theoretical tools to address productive alternatives for native ornamentals with a sustainable, economic and environmental approach

### Session 1: Tuesday, September 22, 2026

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 11:00 Hrs México time	1.Introduction to the Campo Experimental Zacatepec and Laboratories	Japanese students	Dr. Edwin Javier Barrios Gómez
11:00 to 13:00 Hrs Méxicotime	2.Introduction to the course. Presentation of the program and delivery of the practice manual.	Japanese students	Dra. Sandra E. Rangel Estrada

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Av. Progreso Núm. 5, Col. Barrio de Santa Catarina, Alcaldía de Coyoacán, CP. 04010, Ciudad de México,

Tel. (55) 3871 8700 [www.gob.mx/iniqap](http://www.gob.mx/iniqap)

13:00 to 16:00 Hrs Méxicotime	3. Tour of the plant tissue culture laboratory and greenhouses	Japanese students	Dra. Sandra E. Rangel Estrada
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### Session 2: Wednesday, September 23, 2026

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 11:00 Hrs Méxicotime	4. Theory. Basic concepts of plant tissue culture	Japanese students	Dra. Sandra E. Rangel Estrada
11:00 to 12:00 Hrs Méxicotime	5. Theory. Conservation and use of plant genetic resources with ornamental potential	Japanese students	Dra. Sandra E. Rangel Estrada
12:00 to 16:00 Hrs Méxicotime	6. Practice. Preparation of stock solutions, hormones and culture media.	Japanese students	Dra. Sandra E. Rangel Estrada

### Session 3: Thursday, September 24, 2026

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 11:00 Hrs Méxicotime	7. Practice. Asepsis and disinfection techniques in plant tissue (seeds, meristems, buds and nodal segments).	Japanese students	Dra. Sandra E. Rangel Estrada
11:00 to 16:00 Hrs Méxicotime	8. Practice. Establishment of seeds, capsules, meristems (poinsettias, agaves, cacti, palms, orchids)	Japanese students	Dra. Sandra E. Rangel Estrada

### Session 4: Friday, September 25, 2024

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 11:00 Hrs Méxicotime	9.Theory. Genetic improvement and Propagation of orchids. Practice. Orchid pollination	Japanese students	Dra. Sandra E. Rangel Estrada
11:00 to 14:00 Hrs Méxicotime	10. Practice. Micropropagation techniques in poinsettias, orchids, anthuriums, bromeliads, (Organogenesis, TCL, subculture).	Japanese students	Dra. Sandra E. Rangel Estrada
14:00 to 16:00 Hrs Méxicotime	11. Practice. Multiplication and Rooting (poinsettia, bromeliads, orchids)	Japanese students	Dra. Sandra E. Rangel Estrada

## Section 2. Use of native ornamental plants as genetic resources

**Objective:** Learn about laboratories and nursery companies that are dedicated to the propagation and sustainable use of ornamental species native to México.

**Didactic scope:** The section II, addresses theoretically/practically the use of plant genetic resources of ornamental value in a commercial and legal manner, taking into account the risk category of the species, Protected Natural Areas and companies that have Environmental Management Units (EMU's). The topics aimed at undergraduate and graduate students consider the priority of sustainable use, with permits granted by the government and the diversification of the ornamental market. At the end of the Block II agenda, attendees will be able to suggest improvements in the productive and commercial chain of native ornamentals from Morelos to the rest of the Mexican Republic; In addition, they will have the theoretical tools to address productive alternatives with native species from a social, economic and environmental perspective.

**Session 5: Saturday, September 26, 2026**

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 13:00 Hrs México time	12. Commercial propagation of chrysanthemum. Collection and Establishment of meristems and chrysanthemum apices.	Japanese students	Biól. Ricardo Olascoaga
13:00 to 14:00 Hrs México time	13. Practice. Commercial Chrysanthemum Propagation. Phytosanitary Diagnostic Protocol for Certification <i>in vitro</i> chrysanthemum plants.	Japanese students	Biol. Ricardo Olascoaga
14:00 to 16:00 Hrs México time	14. Practice. Acclimatization of ornamental plants <i>in vitro</i> . Poinsettia, chrysanthemums, orchids, agaves, bromeliads	Japanese students	Biól. Ricardo Olascoaga

### Session 6: Sunday, September 27, 2026

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 10:00 Hrs México time	15. Theory. Commercial Micropropagation laboratories in México and Morelos.	Japanese students	Dra. Sandra E. Rangel Estrada
10:00 to 12:00 Hrs México time	16. Tour. FIRA Commercial Micropropagation Laboratory.	Japanese students	Ing. Grecia Coronel
12:00 to 15:00 Hrs México time	17. Tour. Jardines de México. Ornamental marketing Company.	Japanese students	Ing. Luis Granada Carreto

### Session 7: Monday, September 28, 2026

SCHEDULE	ISSUE	AIMED AT	INSTRUCTOR
09:00 to 13:00 Hrs México time	18. Conclusions of the Course. Delivery of Certificates. Closing.	Japanese students	Dra. Sandra E. Rangel Estrada Dr. Edwin Javier Barrios Gómez