

**PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA**

**MINISTRY OF HIGHER EDUCATION  
AND SCIENTIFIC RESEARCH**

**HARMONIZATION**

**MASTER TRAINING OFFER**

**ACADEMIC**

<b>Establishment</b>	<b>Faculty / Institute</b>	<b>Department</b>
<b>Mohamed Khider Biskra University</b>	<b>Faculty of Exact Sciences and Sciences of nature and of the life</b>	<b>Agricultural sciences</b>

**Domain : Natural and life sciences**

**Sector : Agricultural Sciences**

**Speciality : Vegetable production**

**Academic year: 2016-2017**

الجمهورية الجزائرية الديمقراطية الشعبية

وزارة التعليم العالي والبحث العلمي

مواصلة

عرضتكوين ماستر

أكاديمي

القسم	الكلية/ المعهد	المؤسسة
العلوم الزراعية	كلية العلوم الدقيقة و علوم الطبيعة و الحياة	جامعة محمد خيضر بسكرة

الميدان: علوم الطبيعة و الحياة

الشعبة الزراعة

التخصص: إنتاج نباتي

السنة الجامعية: 2016-2017

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**I – Master’s identity sheet  
(All fields must be completed)**

## **1 - Location of the training:**

**Faculty (or Institute): Exact Sciences and Natural and Life Sciences**

**Department: Agricultural Sciences**

## **2- Training partners \*:**

- other partner establishments:

CRSTRA--ITDAS--DSA--INPV-CRBt-UNIVERSITIES

- businesses and other socio-economic partners:

FARMERS-EAC- EAE- DGF-CRSTRA--ITDAS--DSA--INPV-

- International partners: Universities and research institutes

CIRAD – INRA of Paris.

\* = Present the conventions in the appendix to the training

### **3 – Context and objectives of the training**

#### **A–Access conditions**

THEs graduates of the bachelor's degree in agronomy, biology, specialty science and improvement of plant production and any agronomic license which has a link with the field of plant sciences and in particular plant production can give access to the training offered. The graduate will carry out his activity in the field of plant sciences and depending on the course he has followed in Master, will integrate into research teams, research institutes, development institutes and also within production companies.

LEducational training, fundamental, applied and scientific research in the fields of Agronomy and agricultural production as well as environmental preservation is seen in a context of sustainability of crop systems. Future frameworks can address the issue of development and sustainability in different agro-climatic environments.

#### **B - Training objectives** (*skills targeted, educational knowledge acquired at the end of the training - maximum 20 lines*)

The Plant Production and Improvement training prepares students for various research specialties in the field of plant sciences. It is aimed at students interested in the preservation and improvement of plants, physiological and technological approaches, plant biology as well as the enhancement of biodiversity. This training is necessary so that the student can engage in in-depth doctoral-type studies by deepening theoretical and practical knowledge. Internships during training are essential for the student to make contact with the working world.

As such, the graduate in the specialty Plant Production and Improvement in the field of Agronomy and Biology is able to analyze a complex situation, define a context in order to identify the objectives of the study and/or project, to integrate the multidisciplinary dimension of a project and also to participate in scientific animation and technological teaching actions.

#### **C – Targeted job profiles and skills**

Fundamental knowledge in the biological science of plants and their environment. Mastery of technological tools in plant knowledge (potentiality, adaptation,

quantitative and qualitative production).

Acquisition of the methodological bases of research.

Providing students with the means to understand Plant Sciences and their agronomic, technical and biotechnological applications in an integrated manner via a multidisciplinary training offer.

## **D- Regional and national employability potential of graduates**

- Possibility of leading to different agricultural sectors, development institutes and research agronomic At level rregional: uuniversity, businesses ofdevelopment,...

At national level: university and research centers, INRAA, ITGC, ITDAS, CRSTRA, etc.

- Possibility of establishing partnership relations between the university and socio-economic partners in the agricultural and para-agricultural sector in order to satisfy a need and a necessary demand.

## **E – Gateways to other specialties**

Bridges offered with masters in agronomic sciences, genetics, plant biology, genetic engineering, biotechnologies, plant behavior and adaptation.

## **F – Training monitoring indicators**

Periodic evaluation of the program in relation to training requirements and didactic and pedagogical resources.

Mesure of training improvement: design and production of documentation. Optimization de tutura: mettre has there davailability ofs togetherignants Les AVERAGES necessary: offices, telephone, computer, internet,.....

Periodic evaluation of the program in quantitative and qualitative terms and degree of their achievement: through periodic meetings of educational committees and heads of units, A participatory and interactive work of each team.

Assessment of the degree of access to documentation: knowing the works available in terms of quantity and quality.

Evaluation of the degree of use of laboratories and available equipment: Periodic reports on the status of equipment (availability, needs).

Mesure of assets and deficits in carrying out activities: self-diagnosis report.

Measurement and monitoring of the degree of piloting animation: periodic reports and assessments

Construction of a permanent communication plan between teachers, researchers and social partners: meetings and meetings and integration of the latter into training.

## **G – Supervisory capacity**

The supervision capacity for this master's degree:

**Master 1** :20 students.

**Master 2** :20 students.



## 4 – Human resources available

### A: Teachers from the establishment working in the specialty:

Last name First Name	Graduation diploma + Specialty	Diploma Post graduation + Specialty	Grade	Type of intervention *	Registration
BEDJAOUI Hanane	Eng. plant science	Magister	MA (A)	Courses, TD, TP, Supervision	
BENAISSA Kelthoum	Eng. plant science	Magister	MA (A)	Courses, TD, TP, Supervision	
BENAZIZA Abdelaziz	Eng. plant science	Master + Doctorate	MC (A)	Courses, TD, TP, Supervision	
BENZEYOUCHE Salah	Eng. Econ. rural	Master + Doctorate	MC (A)	Courses, TD, TP, Supervision	
BOUKEHIL Khaled	Eng. machinery	Magister	MA (A)	Courses, TD, TP, Supervision	
DJEKIREF Laala	Eng. plant science	Magister	MA (A)	Courses, TD, TP, Supervision	
DJERAH Abdelghani	Eng. plant science	Magister	MA (A)	Courses, TD, TP, Supervision	
DROUAI Hakim	Eng. plant science	Magister	MA (A)	Courses, TD, TP, Supervision	
FARHI Kamilia	Eng. plant science	Magister + Doctorate	MC (B)	Courses, TD, TP, Supervision	
GUIMEUR Kamel	Eng. pedology	Magister	MA (A)	Courses, TD, TP, Supervision	
HADJEB Ayoub	Eng. plant science	Magister	MA (B)	Courses, TD, TP, Supervision	
HAMMOU Faiza	Eng. power technology.	Magister	MA (A)	Courses, TD, TP, Supervision	
HIOUANI fatima	Eng. pedology	Magister	MA (A)	Courses, TD, TP, Supervision	
KESSAI Abla	Eng. pedology	Magister	MA (A)	Courses, TD, TP, Supervision	
MEBREK Naima	Eng. machinery	Magister	MA (A)	Courses, TD, TP, Supervision	
MEHAOUA Med-Seghir	Eng. plant science	Magister + Doctorate	MC (B)	Courses, TD, TP, Supervision	
MELAKHESSOU Zohra	Eng. plant science	Magister	MA (A)	Courses, TD, TP, Supervision	
MEZERDI Farid	Eng. plant science	Magister + Doctorate	MC (B)	Courses, TD, TP, Supervision	

\* = Courses, tutorials, practical work, internship supervision, dissertation supervision, other (to be specified)

**B: External supervision:**

Home establishment:CRSTRA

Last name First Name	Graduation diploma + Specialty	Diploma Post graduation + Specialty	Grade	Type of intervention *	Registration
LAKHDARI Fattoum		PhD	MC	Internship supervision, Dissertation supervision	

Home establishment:Univ.Batna

Last name First Name	Graduation diploma + Specialty	Diploma Post graduation + Specialty	Grade	Type of intervention *	Registration
HALITIM Love		PhD	Pr	Internship supervision, Dissertation supervision	

Reporting establishment: CIRAD

Last name First Name	Graduation diploma + Specialty	Diploma Post graduation + Specialty	Grade	Type of intervention *	Registration
HUGUENIN Johann, Jacques		PhD	Ch. search	Internship supervision, Dissertation supervision	

\* = Courses, tutorials, practical work, internship supervision, dissertation supervision, other (to be specified)

## 5 – Specific material resources available

**A-Educational Laboratories and Equipment:** Sheet of existing educational equipment for the practical work of the planned training (1 sheet per laboratory)

**Laboratory title:** Animal and plant biology laboratory

**Student capacity:** 30

No.	Equipment title	Number	observations
1	Orbital shaker	02	
2	Mechanical stirrer	01	
3	Multi-parameter field analyzer (pH, conductivity, oximeter)	01	
4	Apparatus from Casa Grande	01	
5	Camera	01	
6	Sand bath 06l	01	
7	Water bath	04	
8	Electronic scale with internal calibration, range 150g/65g	02	
9	Compass	01	
10	Munsell Charter	01	
11	Digital stopwatch	05	
12	Clinometer	01	
13	Membrane hydrometer	01	
14	Universal oven	04	
15	Ceramic plate extractor; Richard's device	01	
16	Muffle furnace	01	
17	GPS III Plus	01	
18	Auger kit for sampling heterogeneous soils	01	
19	Laboratory glassware washing	01	
20	Percussion penetrometer	01	
21	Fixed and variable head permeameter	01	
22	Polar digital planimeter	03	
23	Diaphragm pump	02	
24	Electronic total station with memory	01	
25	Pocket stereoscope.	08	
26	Folding mirror stereoscope	01	
27	HP designjet 800 plotter and scanner	01	
28	Analytical sieve (gamma of 23 different mesh openings)	01	
29	Dial blood pressure monitor	01	
30	Electronic digital theodolite	01	
31	Mineralizer with heating block 06 stations	01	
32	Osborne Reynolds flow regime demonstration module	01	
33	Automatic level with straight optics	02	
34	Benchtop pH/mV meter	06	
35	Flame photometer	01	

36	Crucible tongs	30	
37	Atomic absorption photometer	01	
38	Plastic tray	10	
39	Hydrostatic pressure	01	
40	Backpack sprayer	01	
41	Mineralization ramp	01	
12	Laboratory refrigerator	01	
43	UV-VIS spectrophotometer	03	
44	Automatic universal titrator	01	
45	Dissection kits	10	
46	Laboratory turbidimeter	01	
47	Nitrogen distillation unit 06 stations	01	

## B- Internship sites and company training:

<b>Training place</b>	<b>Number of students</b>	<b>Training period</b>
INRAA/Algiers	10	07 days
<i>ITDAS BISKRA</i>	10	07 days
<i>INRABISKRA / ALGIERS</i>	10	07 days
<i>INPVBISKRA / ALGIERS</i>	10	07 days

### C- Master's support research laboratory(ies):

<b>Head of the laboratory: BELHAMRA Mohamed</b>
<b>Laboratory approval number: No. 87 of 04/14/2013</b>
<b>Date :</b> <b>Opinion of the laboratory head: Ecosystem diversity and dynamics of agricultural production systems in arid zones</b>

### D- Master's support research project(s):

<b>Title of the research project</b>	<b>Project code</b>	<b>Project start date</b>	<b>Project end date</b>
Optimization of agricultural production in the conditions of the Ziban region: Impact of salinity and heavy metals	F01420130035	01/01/2014	01/01/2017

### E- Personal work spaces and ICT:

The research work on which students are supervised aims to diversify the mode of appropriation of content of the Master's program in Plant Production and Improvement, based on an interdisciplinary approach. They also aim to develop students' capacities for autonomy and initiative in research, as well as know-how in the field.

The educational laboratories are equipped with essential basic equipment for carrying out the practical work offered. However, other materials remain to be acquired in order to ensure quality training. Practical field work also helps the

student apply theoretical knowledge and learn plant production and improvement processes.

## **II – Half-yearly teaching organization sheet**

(Please present the forms for the 4 semesters)

## 1- Semester 1

unity of Teaching	V.H.	v.H weekly				VSoeff.	VSredits	Mevaluation code	
	14-16	V	TD	TP	Autres			VScotin	Eexamin
<b>uFundamental E</b>									
<b>EUF1</b>									
Cereal farming I	67.5	1h30	1h30	1h30	82.5	3	6	50%	50%
Market gardening I	67.5	1h30	1h30	1h30	82.5	3	6	50%	50%
Mushrooms	22.50	1h30/2w	-	1h30/2w	27.5	1	2	50%	50%
<b>EUF2</b>									
Genetics and plant breeding	45	1h30	1h30		55	2	4	50%	50%
<b>EU methodology</b>									
<b>UEM1</b>									
Data processing Statistics	37.5	1h30	1h		37.5	2	3	50%	50%
<b>UEM2</b>									
Irrigation	22.50	1h30	-		27.5	1	2	50%	50%
Fertilization	45	1h30	1h30		55	2	4	50%	50%
<b>uE discovery</b>									
<b>UED1</b>									
Professional Ethics	22.5	1h30			2.5	1	1	50%	50%
Rebibliographical referencesand	22.5	1h30			2.5	1	1	50%	50%
<b>uE transverse</b>									
<b>UET1</b>									
Subject 1: Communication	22.5	1h30			2.5	1	1	50%	50%
<b>TotalSemester1</b>	<b>375</b>				<b>375</b>	<b>17</b>	<b>30</b>		



## 2- Semester 2

unity of Teaching	V.H.S	v.H weekly				VSoeff	VSredits	Mevaluation code	
	14-16 weeks	V	TD	TP	Autres			VScotin	Eexamina
<b>uFundamental E</b>									
<b>EUF1</b>									
Cereal farming II	67.5	1h30	1h30	1h30	82.5	3	6	50%	50%
VSulturesMaraichères II	67.5	1h30	1h30	1h30	82.5	3	6	50%	50%
<b>EUF2</b>									
Fodder crops	33.75	1h30		1h30/2w	41.25	2	3	50%	50%
Industrial crops	33.75	1h30		1h30/2w	41.25	2	3	50%	50%
<b>uE methodologies</b>									
<b>EMU1</b>									
Plant biotechnology and molecular tools	37.5	1h30		1h	37.5	2	3	50%	50%
Production systems	22.50	1h30			27.5	1	2	50%	50%
<b>UEM2</b>									
Conservation agriculture	22.50	1h30			27.5	1	2	50%	50%
Plant product processing technology	22.50	1h30			27.5	1	2	50%	50%
<b>uE discovery</b>									
<b>UED1</b>									
Aromatic plants and condiments	22.50	1h30			2.5	1	1	50%	50%
Post-harvest	22.50	1h30			2.5	1	1	50%	50%
<b>uE transverse</b>									
<b>Subject 1:Legislation</b>	22.5	1h30			2.5	1	1	50%	50%
<b>TotalSemester2</b>	<b>375</b>				<b>375</b>	<b>18</b>	<b>30</b>		

### 3- Semester 3:

unity of Teaching	V	v.H weekly				VSoeff.	VSredits	Mevaluation code	
	14-16	VS	TD	TP	Autres			VScontinuu	Eexaminati
<b>Fundamental EU</b>									
<b>UEF1</b>									
Crop pests	45	1h30		1h30	55	2	4	50%	50%
Crop diseases	45	1h30		1h30	55	2	4	50%	50%
Weed science	45	1h30		1h30	55	2	4	50%	50%
<b>UEF2</b>									
Stressabioticsinplants	45	1h30	1h30		55	2	4	50%	50%
Special arboriculture and viticulture	22.5	1h30			27.5	1	2	50%	50%
<b>uE methodologies</b>									
<b>EMU1</b>									
Planning and improvement strategies	37.5	1h30	1h		37.5	2	3	50%	50%
Crop models	22.5	1h30			27.5	1	2	50%	50%
<b>EMU2</b>									
HASinstrumental analysis	45	1h30		1h30	55	2	4	50%	50%
<b>uE discovery</b>									
<b>EU discoveries</b>									
<b>UED1</b>									
GIS and remote sensing	45	1h30		1h30	5	2	2	50%	50%
<b>Transversal EU</b>									
<b>UET1</b>									
Subject 1: Entrepreneurship and project management	22.5	1h30			2.5	1	1	50%	50%
<b>Total Semester 3</b>	<b>375</b>				<b>375</b>	<b>17</b>	<b>30</b>		

#### 4- Semester 4:

Domain :Natural and life sciences  
Sector :Agronomy  
Speciality :Plant production and improvement

Internship in a company culminating in a dissertation and a defense.

	VHS	coefficient	Credits
<b>Personal Work (Memory)</b>	500*	10	20
<b>Internship in company</b>	250**	5	10
<b>Seminars</b>			
<b>Other (Thesis/Internship)</b>			
<b>Total Semester4</b>	750	15	<b>30</b>

\*UEF

\*\*EMU

**5- Overall summary of the training:**(indicate the separate global VH in progress, TD, for the 04 semesters of teaching, for the different types of EU)

EU V.H.	UEF	EMU	UED	UET	Total
<b>Course</b>	281.25	225	112.5	67.5	686.25
<b>T.D.</b>	135	52.5	0	0	187.5
<b>TP</b>	191.25	37.5	22.5	0	251.25
<b>Personal work</b>	742.5	360	15	7.5	1125
<b>Dissertation and internship</b>	500	250	0	0	750
<b>Total</b>	<b>1850</b>	<b>925</b>	<b>150</b>	<b>75</b>	<b>3000</b>
<b>Credits</b>	<b>74</b>	<b>37</b>	<b>6</b>	<b>3</b>	<b>120</b>
<b>% in credits for each EU</b>	61.67	30.83	5.00	2.50	100%

### **III - Detailed program by subject** (1 detailed sheet per subject)

# **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEFundamental 1**

**Subject Title: Cereal Cultivation I**

**Credits: 06**

**Coefficients: 03**

**Teaching Objectives**

To enable students to acquire knowledge of cereal biology and the study of secondary cereal and pseudo-cereal species that may have economic significance.

**Recommended Prerequisite Knowledge**

Students should have a background in plant biology.

**Subject Content:**

**Chapter I:** Review of Cereal Morphology

**Section 1:** Vegetative Apparatus

**Section 2:** Reproductive Apparatus

**Chapter II:** Study of Secondary Cereals and Pseudo-Cereals of Interest

**1- Quinoa**

**2- Buckwheat**

**3- Spelt (hulled wheats):**

- Einkorn (*T. monococcum*)

- Emmer (*T. dicoccum*)

- Spelt (*T. spelta*)

**4- Fonio**

**5- Millet**

**6- Amaranth**

**7- Canary Grass (*Phalaris canariensis*)**

**8- Chia**

**Tutorials:** Preparation of technical sheets for cereals and pseudo-cereals.

**Practical Work:** Field practicals, cultivation setup, observation of early stages, and density calculation.

**Personal Work:** Seminar, field trips, and/or other activities.

**Evaluation Method:** Exam, continuous assessment, tutorials, and practicals.

**References** (Books, lecture notes, websites, etc.).

# **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEFundamental 1**

**Title of the subject:Market gardening I**

**Credits: 06**

**Coefficients: 03**

## **Teaching objectives**

This module is intended to classify market garden species, the common bases for vegetable production (multiplication), and natural production conditions. It covers the main market gardening techniques and methods such as plasticulture. to be implemented to produce vegetables in different seasons. Thus, the notion of protected cultures.

## **Recommended prior knowledge**

Knowledge of the concepts of bioclimatology is essential, also concepts of plant physiology are necessary for this module.

### **Chap. I: Classification of market garden species according to the part consumed**

1. leafy species
2. fruit species
3. root species
4. bulbous species
5. tuber species
6. stem species
7. species with inflorescences
8. seed species

### **Chap. II: Natural conditions of market gardening**

- 1- Climate
- 2- Ground
- 3- Fertilization
- 4- Crops under shelter
  - a) greenhouse effect
  - b) construction materials
  - c) roofing materials
  - d) types of shelters
  - e) soil mulching

### **Chap. III: Multiplication of market garden species**

- 1- seed quality
- 2- nursery
- 3- germination condition
- 4- sowing depth
- 5- nursery technique

### **Chap. IV: Planting**

- 1- types of plants
- 2- planting stage and time
- 3- planting depth
- 4- planting density
- 5- interval
- 6- type of planting
- 7- crop rotation and rotation

### **Chap. V: Harvest**

- 1- maturity
- 2- harvest stage
- 3- type of harvest
- 4- conditioning

**Tutorials** :production of technical sheets for market gardening

**Practical work**:practical work in the field; installation of market gardening, and monitoring.

**Personal work** :Seminar, outing and/or others

**Evaluation method**:examination, continuous assessment, TD and TP.

**References:**

# **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEFundamental 1**

**Title of the subject:Mushrooms**

**Credits: 02**

**Coefficients: 01**

## **Teaching objectives**

Modalities of heterotrophy, classification of edible mushrooms (mushroom), Biology and seeds, cultivation methods, compost and pasteurization, cultivation technique (seeding, incubation, casing), harvest.

## **Material content:**

### **Chapter I: General**

1-Modalities of heterotrophy of edible mushrooms:

(Mushrooms and Truffles)

2-Biology of edible mushrooms(Basidiomycetes)

3-Chemical composition

4-Benefits of edible mushrooms

### **Chapter II: Cultivation of mushrooms**

**1**-Cultivation methods in stacks, boxes and plastic bags

**2**-Cultivated compost: Composition, Composting and Pasteurization

**3**-Seeding and Incubation of the mycelium

**4**-Casing of the mycelium

**5**-Cultivation and fruiting

**6**-Production of carpophores and harvest

### **Chapter III: Factors influencing fruiting body yield**

1-Nature of the nitrogen source

2-The knowledgegrowth factors

3-Temperature and pH

**Practical work** :mushroom culture test

**Personal work** :Seminar, outing and/or others

**Evaluation method**:examination, continuous assessment and practical work.

## **References**

# **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEFundamental 2**

**Title of the subject:Ggenetics and plant improvement**

**Credits: 04**

**Coefficients: 02**

## **Teaching objectives**

The genetic improvement of plants section aims to introduce the student to the theoretical bases of the different interactions between genes, the principles and strategies of improvement and selection. This material also allows it to analyze and manage the biodiversity of species, have basic notions of cytogenetics and quantitative heredity.

## **Recommended prior knowledge**

Mastery of genetics, biology and agronomic and physiological elements are necessary to understand the genetic improvement module of plants.

## **Content of the material:**

### **Chapter 1: Genetic resources**

1. Interests and issues
2. Genetic erosion
3. Genetic pollution
4. Use of wild species in plant improvement.
5. Plant genetic resources in Algeria.

### **Chapter 2: Theoretical bases of improvement**

1. Elusive genes: modalities and meaning of polygenic heritability
2. Biological significance of additivity: linkages
3. Heterozygosity: inbreeding and heterosis
4. Value of an individual in crossbreeding
5. Structures of natural populations

### **Chapter 3: Methods for improving annual and fruit species**

1. Comparison between the improvement of annual and perennial species.
2. Methods for improving annual and perennial species.

### **Chapter 4: Cytogenetics**

1. Types of chromosomes in Eukaryotes
2. Euploidy in Eukaryotes
3. Pseudo polyploidy
4. Natural and artificial diploidization of polyploids
- 5 Aneuploidy and its role in evolution.

### **Chapter 5: Quantitative Genetics**

1. Reminders of some statistical concepts
2. Heritability of a trait
3. Evolution of heterozygosity over generations.

### **Chapter 5: Population genetics**

1. Definitions
2. Hardy-Weinberg equilibrium
3. Gene frequency calculation
4. Modification of genetic frequencies

**Personal work :Seminar, outing and/or others**

**Evaluation method:examination, continuous monitoring and TD**

## **References**



## **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEMethodology1**

**Title of the subject:Statistical data processing**

**Credits: 04**

**Coefficients: 02**

**Teaching objectives:**This module is of capital importance in setting up experimental tests, analyzing data and interpreting them in order to draw reliable conclusions using the appropriate software.

### **Recommended prior knowledge**

To acquire these notions, knowledge of statistics and general computer science is essential.

### **Content of the material:**

1. One-dimensional descriptive statistics
2. Sampling methods
3. General problems of field experimentation
4. Test for comparison of two means
5. Studies of some experimental designs (total randomization, Fisher blocks, Latin square, randomized factorial, split plot)
6. Interpretation of the results of the analysis of variance
  - 6.1. Normality
  - 6.2. Tukey test
  - 6.3. Interaction
  - 6.4. Coefficient of variation
8. Covariance analysis
  - 8.1. Linear regression
  - 8.2. Adjustment right

**Personal work :**Seminar, and/or others

**Evaluation method:** examination, continuous assessment and tutorial

**References** (*Books and handouts, websites, etc.*).

# **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEMethodology2**

**Title of the subject: Irrigation**

**Credits: 02**

**Coefficients: 01**

## **Teaching objectives**

The objective of the module is to provide students with the irrigation method and tools in order to save water and combat the constraints that can oppose irrigation.

### **VScontent:**

#### **I- Irrigation techniques**

1. Surface flow irrigation
2. Sprinkler irrigation
3. Micro-sprinkler irrigation
4. Micro-irrigation irrigation
5. Flood irrigation
6. Underground irrigation methods (underground oozers)

#### **II- Irrigation-soil relationship**

1. The rate of infiltration or permeability
2. The useful reserve (RU)
3. The easily usable reserve

#### **III- Irrigation-plant relationship**

1. Water requirements of the plant
2. Kc: Crop coefficient
3. AND P

#### **IV- Irrigation practices in drylands**

**Personal work** :Seminar, outing and/or others

**Evaluation method:**continuous review and monitoring

### **References**

- Management control.Pearson Education.
- Management control and management of the company.
- The new faces of management controlTools and behaviors.

# **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEMethodology2**

**Title of the subject:Fertilization**

**Credits: 04**

**Coefficients: 02**

## **Objectives of teaching**

Teach students the basic notions of fertilization, diagnosis and methods of assessing fertility.

## **Content of the material:**

### **I. Nutrients**

1. The major elements (macroelements)
2. Secondary elements or meso-elements
3. Minor elements or micro-elements or trace elements
4. Useful elements

### **II. Fertilization laws**

- II.1 Law of land restitutions (law of advances)
- II.2 Law of the minimum or Liebig
- II.3 Law of less than proportional increases
- II.3 Interaction law
  - Concepts of levies, exports and refunds

### **III. Fertilizers**

- 1- Types of fertilizers
  - 1.1. Organic fertilizers
  - 1.2. Mineral fertilizers
  - 1.3. Organo-mineral fertilizers
2. Main fertilizers
  - 2.1 Nitrogen fertilizers
    - 2.1.1. Organic nitrogen fertilizers
    - 2.1.2 NH<sub>4</sub><sup>+</sup> ammonia nitrogen fertilizers
      - 2.1.2.1 Main ammonia EAs
      - 2.1.2.3 Nitric nitrogen fertilizers
        - 2.1.2.3.1 The main nitrate EAs
      - 2.1.2.4 Nitric ammonia fertilizers
    - 2.2. Phosphated Fertilizers
      - 2.2.1 Soluble EP
      - 2.2.2E.P. hyposoluble
      - 2.2.3 Insoluble EP
    - 2.2 Potassium fertilizers
      - 2.3.1. Potassium chloride (KCl)
      - 2.3.2. Potassium sulfate (K<sub>2</sub>SO<sub>4</sub>)
      - 2.3.3. Potassium and magnesium double sulfate (K<sub>2</sub>SO<sub>4</sub>, MgSO<sub>4</sub>)
  3. Properties and quality standards of fertilizers
  4. Fertilizer application method
    - 4.1 Broadcasting
    - 4.2 Line or strip location
    - 4.3 Foliar Application

### **IV. Fertigation**

**Tutorials** :fertilization exercises

**Personal work** :Seminar, outing and/or others

**Evaluation method**: examination, continuous assessment and tutorial.

**References** (Books and handouts, websites, etc.).

## **Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:UEDécouverte1**

**Title of the subject:Professional Ethicsالأخلاق المهنية**

**Credits: 01**

**Coefficients: 01**

**Master's title:** Plant production and improvement

**Semester:** S1

**Title of the unit:** UEDécouverte 1

**Subject title:** Professional ethics

**Credits:** 01

**Coefficients:** 01

### **Teaching objectives**

The objective is to teach the student the main values for the development of the human being. Therefore, prepare him for practical life to serve our country and our community without corruption.

### **Recommended prior knowledge**

### **Module content:**

#### **I-Definition of ethics, indicators, sources and status**

- **1-Definition of ethics**
- **2-Indicators**
- **3-Source of ethics, is it innate or acquired?**
- **4-Status of ethics, is it fixed or relative?**

#### **II-Values, bases of professional ethics**

- **1-Community values**

**-loyalty, solidarity, dialogue, commitment, interdisciplinarity, collaboration**

- **2-Professional values**

**- competence, diligence, scientific integrity, intellectual property, probity, transparency, continuity, efficiency, diligence, conformity, balance, disinterestedness, confidentiality, accountability,**

#### **III-Professional ethics, nature, importance and impact in reality.**

- **1-What is professional ethics?**
- **2-Importance of professional ethics?**
- **3-Effects of ethics in the workplace**

#### **IV-Professional ethics in certain jobs.**

- **1-Relationship between regulations, decisions and ethical standards in the company**
- **2-Examples of ethics for some functions and professions**

#### **V-How to develop professional ethical commitment in the individual?**

- **1-Importance of the application and implementation of professional ethics**
- **2-Concrete suggestions for the development of professional ethics**

- **3-Cognitive suggestions for the development of professional ethics**

**Personal work:** presentations, and/or others

**Evaluation method:** examination and continuous assessment

**References** (Books and handouts, websites, etc.).

### **Bibliographic references and article writing**

Title of the Master: Plant production and improvement

**Semester:** S1

**Title of the EU:** UEDécouverte1

**Title of the subject:** Bibliographic references and article writing

**Credits:** 01

**Coefficients:** 01

#### **Teaching objectives**

Present the fundamental rules of bibliographic research, write bibliographic references for the main types of document and use a scientific article.

#### **Recommended prior knowledge:**

Knowledge of languages (reads, writes)

#### **Material content:**

- Search and classification of references,
- Writing rules,
- Different parts of an article and their content,
- Presentation and use of articles.

**Personal work:** presentations and/or others

**Evaluation method:** examination and continuous assessment

#### **References**

**Title of the Master: Plant production and improvement**

**Semester: S1**

**EU Title:EUTransversal 1**

**Title of the subject:communication**

**Credits: 01**

**Coefficients: 01**

**Teaching objectives**

Mastery of scientific communication and proficiency in English

**Recommended prior knowledge**

Knowledge of English (reads, writes)

**VScontent:**

- English courses (written and spoken) with support and support through articles and publications written in English.
- Scientific communication (overview of the different forms of scientific communication)
- Memory and thesis.
- Search support.
- Oral communication of research results.
- Scientific communication in the form of a poster.
- Science in the media.
- Licences.

**Personal work** :exposed and/or others

**Mevaluation code:**continuous review and monitoring

**Rreferences** (*Books and handouts, websites, etc.*).

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEFundamental 1**

**Title of the subject:Cereal farming II**

**Credits: 06**

**Coefficients: 03**

**Teaching objectives:** allow students to acquire the scientific and technical bases of the production of cereal species (wheat, barley, triticale, corn, etc.)

### **Recommended prior knowledge**

Cereal biology and general agriculture.

### **Content of the material:**

#### **1- Sorghum**

Botany and species requirements

Technical route

#### **2- Triticale**

Botany and species requirements

Technical route

#### **3- The Rye**

Botany and species requirements

Technical route

#### **4- The corn**

Botany and species requirements

Technical route

#### **5- Barley**

Botany and species requirements

Technical route

#### **6- Oats**

Botany and species requirements

Technical route

#### **7- Durum wheat**

Botany and species requirements

Technical route

#### **8- Soft wheat**

Botany and species requirements

Technical route

**Tutorials:**production of cereal technical sheets

**Practical work:**practical work in the field, followed by cereal crops, installed in the first semester and determination of its yields.

**Personal work :**Seminar, outing and/or others

**Mevaluation code:**examination, continuous monitoring,TP and TD.

**References** (*Books and handouts, websites, etc.*).

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Establishment: Mohamed Khider University

Title of the master: Plant production

Academic year: 2016-2017Page31

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEFundamental 1**

**Title of the subject:Vegetable Crops II**

**Credits: 06**

**Coefficients: 03**

### **Teaching objectives**

To allow the student to know the basic principles of crops under flat tarpaulins and the production of the main vegetable species having an economic interest especially in Algeria.

#### **Content of the material:**

##### **I- Flat cultivation under tarpaulin:**

- 1- characteristics of flat tarpaulins
- 2- set up
- 3- choice of tarpaulins
- 4- phytosanitary protection
- 5- uncovering
- 6- usage limits

##### **II Study of some species**

- 1- Chapter 1: The potato
- 2- Chapter 2: The tomato
- 3- Chapter 3: Zucchini
- 4- Chapter 4: Lettuce
- 5- Chapter 5: Cauliflower
- 6- Chapter 7: The melon
- 7- Chapter 8: Chilli and pepper

**Tutorials:**production of technical sheets for market gardening

**Practical work:**practical work in the field, installation of market gardening, and observation of their development.

**Personal work :**Seminar, outing and/or others

**Evaluation method:** examination, continuous monitoring,TD and TP.

**References** (*Books and handouts, websites, etc.*).



# **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEFundamental 2**

**Title of the subject:Fodder crops**

**Credits: 03**

**Coefficients: 02**

**Goals:** Study of some forage crops. Techniques and conservation of fodder.

**Content of the material:**

## **I. Generality**

Definition of Fodder and Fodder Unit, Main sources of fodder, Maintenance of meadows.

## **II. Forage species and Algerian bioclimatic zones**

### **1. Forage grasses.**

- ✓ Barley: (*Hordium vulgare* L.)
- ✓ Ray Grass from Italy: (*Lolium multiflorum*)
- ✓ Tall fescue: (*Festuca elatior*)
- ✓ Corn: (*Zea mays*)
- ✓ Sorghum: (*Sorghum vulgare*)

### **2. Fodder legumes**

- ✓ Perennial Alfalfa: (*Medicago sativa*)
- ✓ Annual Alfalfa: (*Medicago sp.*)
- ✓ Clover: (*Trifolium fragiferum*)
- ✓ Alfalfa shrub: (*Medicago arborea*)
- ✓ Acacia: (*Acacia cyanophylla* Australia)

### **3. Cruciferae family**

- ✓ Foraged rapeseed: (*Brassica napus*)
- ✓ White mustard: (*Sinapis alba*)
- ✓ Fodder cabbage: (*Brassica oleracea*)
- ✓ Foraged turnip: (*Brassica campestris*)

### **4. Family Chenopodiaceae**

- ✓ Fodder beet: (*Beta vulgaris*)
- ✓ G'taf: (*Atriplex halimus*)

### **5. Family of compounds**

- ✓ Jerusalem artichoke: (*Helianthus tuberosus*)

### **6. Family Cactaceae**

- ✓ Smooth cactus (without thorns)

## **III. Conservation of fodder**

### **1. Silage**

1.1. Definition

1.2. Evolution

- ✓ Breathing
- ✓ Action of enzymes
- ✓ Fermentation

### **2. Drying**

- ✓ Wilting
- ✓ Salting
- ✓ Barn drying
- ✓ Artificial dehydration

## **Practical work**

Installation and monitoring of forage crops

**Personal work :**Seminar, outing and/or others

**Evaluation method:**examination, continuous assessment and practical work

**Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEFundamental 2**

**Title of the subject:VSindustrial cultures**

**Credits: 03**

**Coefficients: 02**

**Teaching objectives**

Know the importance of industrial crops. Study of some industrial species.

**Material content:**

**Chapter 1:** Henna

**Chapter 2:** Peanut

**Chapter 3:** Cotton

**Chapter 4:** Corete

**Chapter 5:** Flax

**Chapter 6:** Sesame

**Chapter 7:** Saffron

**Chapter 8:** Mint

**Practical work**

Installation and monitoring of industrial crops

**Personal work :**Seminar, outing and/or others

**Evaluation method:**examination, continuous monitoringand TP.

**References**(*Booksand handouts, websites, etc.*):

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEMethodology1**

**Title of the subject:Plant biotechnologies and molecular tools**

**Credits: 04**

**Coefficients: 02**

### **Teaching objectives**

Allow the student to have fundamental knowledge on the different applications of plant biotechnologies and the use of molecular tools in improving plant production.

### **Recommended prior knowledge**

The student must have basic knowledge of cell biology, genetics and molecular biology.

### **Content of the material:**

#### **Chapter 1: Biotechnology Overview**

1. Definitions
2. Applications of biotechnology:
  - 1.1. Animals
  - 1.2. Industry
  - 1.3. Vegetal
2. History and statistics
3. Biotechnology typologies

#### **Chapter 2: Molecular bases of biotechnologies**

1. Plant gene regulation mechanisms
  - 1.1. Pseudogenes:
  - 1.2. Intron-exon splitting
  - 1.3. Let's transpose
  - 1.4. Cytoplasmic organelles:
2. Management of "epigenetic" regulatory mechanisms
3. Totipotency of the plant cell

#### **Chapter 3: In vitro culture**

1. Emergence of in vitro culture techniques
2. Secondary metabolite production
3. Transgenesis
4. Culture in vitro
  - 4.1. Definition
  - 4.2. Principle:
  - 4.3. Uses
  - 4.4. Technical aspects
  - 4.5. Environmental factors
    - 4.5.1. Composition of the culture medium
    - 4.5.2. Growth regulators

#### **Chapter 4: Biotechnologies applied to plants**

1. Cloning of genotypes: VITROPLANTS
2. Meristem culture: sanitizing cultures:
3. Somatic embryogenesis
4. Artificial seeds
5. Somaclonal variation: vitrvariants
6. Haplodiploidization
7. Interspecific hybridizations

8. Somatic hybridization: “Protoplast fusion”

**Chapter 5: Molecular markers and plant improvement**

1. Molecular markers and early plant breeding.
2. Characteristics of a genetic marker:
3. Marker Assisted Selection (MAS)
4. Electrophoresis
5. Polymerase Chain Reaction
6. Molecular markers
  - 6.1. DNA Restriction Fragment Length Polymorphism (RFLP)
  - 6.2. Random DNA amplification polymorphism by PCR: (RAPD).
  - 6.3. 'Microsatellite' type markers (SSR).

**TP:**Outing to see in vitro culture techniques

**Personal work :**Seminar, outing and/or others

**Evaluation method:**examination, continuous assessment and practical work

**References**

# **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEMethodology1**

**Title of the subject:Production systems**

**Credits: 03**

**Coefficients: 01**

## **Oobjectives of teaching**

Studies of the different agricultural production systems in Algeria, making the difference and determining the means of improving these systems.

## **VScontent:**

### **I. Agricultural production systems according to the mode**

1. intensive farming
2. extensive agriculture
3. biointensive micro-agriculture
4. Organic Agriculture
5. sustainable agriculture
6. sustainable agriculture
7. biodynamic agriculture
8. subsistence farming
9. peasant agriculture
10. subsistence farming
11. precision agriculture

### **II. Agricultural production systems according to zones (Algeria)**

#### **1. Irrigated system**

Vegetable crops  
Fruit crops  
Cereals and fodder

#### **2. Mixed highland production system (dry and irrigated)**

Cereal crops  
Vegetable crops  
Arboriculture (fruits and olives)

#### **3. Rainfed mixed production system**

Arboriculture and vines  
Vegetable crops (melon, watermelon and tomato)  
Cereals (and pasture in summer)

#### **4. Mixed system in arid zones**

Cereals and fodder (combined with livestock)

#### **5. Pastoral system**

#### **6. Dispersed (arid) system**

#### **7. Making an Exit**

**Personal work** :Seminar, outing and/or others

**Mevaluation code**:examination, continuous assessment and exit note.

## **References**

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEMethodology1**

**Subject Title: Conservation Agriculture**

Credits: 02

Coefficients: 01

### **Teaching Objectives:**

To understand the main elements of the regulations applicable to conservation agriculture. To be familiar with the challenges and economic conditions of its development. To comprehend the contributions of conservation agriculture to various aspects of product quality. To empower students to analyze the technical, economic, and social implications, as well as the strengths and challenges of conservation agriculture development, in order to identify conditions for success and propose solutions for specific cases.

### **Subject Content:**

1. History and Definition of Conservation Agriculture (CA)
  - 1.1 Definition according to the Food and Agriculture Organization (FAO)
  - 1.2 Conservation agriculture as sustainable and integrated farming
2. Contributions of Conservation Agriculture
  - 2.1 Environmental Aspects
    - 2.1.1 Limitation of soil erosion
    - 2.1.2 Improvement of water protection and quality
    - 2.1.3 Increase in biodiversity and biological activity
    - 2.1.4 Contribution to greenhouse gas reduction
  - 2.2 Agronomic Aspects
    - 2.2.1 Enrichment and concentration of surface soil organic matter
    - 2.2.2 Improvement of soil structure and structural stability
    - 2.2.3 Limited influence on fertilization
    - 2.2.4 Favorable conditions for slugs, diseases, and weeds?
    - 2.2.5 Yields sensitive to structural incidents
  - 2.3 Economic Aspects
    - 2.3.1 Time and fuel savings
    - 2.3.2 Nuanced impact on expenses
    - 2.3.3 Variable Operating Margin depending on situations
3. Crop Rotation and Residue Management in Conservation Agriculture
4. Weed Management in Conservation Agriculture Systems
5. Nutrient Management in Conservation Agriculture
6. Crop Protection in Conservation Agriculture
7. Agricultural Machinery for Conservation Agriculture
8. Advantages and Disadvantages of Conservation Agriculture

### **Personal Work:**

Seminar, field trips, and/or other activities

### **Evaluation Method:**

Exam and continuous assessment.

**References:** (Books, lecture notes, websites, etc.).

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:Methodology**

**Title of the subject:Plant product processing technology**

**Credits: 02**

**Coefficients: 01**

**Objectives of teaching**

Packaging of agricultural products, olive oil industry, processing of dates, preservation of fruits and vegetables, fermentation industry.

**VScontent:**

**Chapter I: Packaging of agricultural products**

- 1.Post-harvest management of agricultural products
2. Packaging activity (unloading, sorting, cleaning, wax application, calibration)
3. Packaging, storage and transportation of agricultural products

**Chapter II: The olive oil industry**

- 1-Olive production
- 2-Study of the raw material
- 3-Olive product technology
- 4-Refining lampante olive oil
- 5-Olive pomace oil

**Chapter III: Processing of dates**

- 1- Knowledge of the raw material
  - Texture
  - Sugar content
- 2- Possibilities of processing the date
  - valuation of production
    - Diversification of production
    - Use of waste

**Chapter IV: Preservation of fruits and vegetables**

**Personal work** :Seminar, outing and/or others

**Mevaluation code:**continuous review and monitoring.

**Rreferences** (Books and handouts, websites, etc.).

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title:UEDécouverte1**

**Title of the subject:Aromatic plants and condiments**

**Credits: 01**

**Coefficients: 01**

### **Teaching objectives**

The objective is to introduce the student to the main spices and aromatic herbs, and how to cultivate them.

### **Recommended prior knowledge**

Knowledge of plant production is necessary for this module.

### **Material content:**

#### **Part one: Aromatic plants**

1. History
2. Production area
3. Study of species
4. Cultivation techniques
5. Harvesting and packaging
6. Extraction and transformation processes

#### **Part two: Spices**

##### **Chapter 1.**General information on condiments

- 1- Definitions
- 2- Classifications of condiments or spices

##### **Chapter 2.**State of condiment species in Algeria: species, area, yields, Constraints

##### **Chapter 3.**Condiment species producing underground organs (Ginger, Turmeric)

##### **Chapter 4.**Condiment species producing stem bark (Cinnamon)

##### **Chapter 5.**Condiment species producing flower buds and floral parts (Clove, Saffron, Safflower)

##### **Chapter 6.**Condiment species producing seeds (Coriander, caraway, Fennel, Cumin, Anise,)

##### **Chapter 7.**Essential oils

**Personal work :**Seminar, outing and/or others

**Evaluation method:**continuous review and monitoring.

**References**(*Books and handouts, websites, etc.*)



## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title: UEDécouverte1**

**Title of the subject: Post-harvest**

**Credits: 01**

**Coefficients: 01**

### **Objectives of teaching**

This module aims to control a certain number of factors which determine the quality of the fruit from its harvest to its conservation in a fresh state.

### **VSccontent:**

#### **Chapter 1: the physiology of fruit ripening**

- 1- The physiology of fruit ripening
- 2- Factors that affect fruit conservation

#### **Chapter 2: Standardization of fruits**

- 1- Commercial quality of fruit
- 2- Fruit packaging

#### **Chapter 3: fruit preservation**

- 1- Evolution of fruits after harvest
- 2- Role of cold for conservation
- 3- Artificial cold preservation methods

#### **Chapter 4: Fruit storage diseases**

- 1- Accidents of physiological origin or physiological disorders.
- 2- Accidents of cryptogamic origin.

**Personal work :**Seminar, outing and/or others

**Mevaluation code:**continuous review and monitoring

**Rreferences** (*Books and handouts, websites, etc.*).

## **Title of the Master: Plant production and improvement**

**Semester: S2**

**EU Title: Transverse**

**Title of the subject: Legislation**

**Credits: 01**

**Coefficients: 01**

**Teaching objectives:** The course will mainly focus on environmental regulations in Algeria

### **Recommended prior knowledge:**

Law, environment, legislation.

### **Content of the material:**

1. General introduction.
  - 1.1. Overview of all the legislation in this area.
  - 1.2. Application of environmental law.
  - 1.3. Citizen participation.
2. The main legal instruments.
  - 2.1. Plans in land use planning.
  - 2.2. Limited interference and emission values.
  - 2.3. Impact studies: procedure and legal consequences.
  - 2.4. Inventories: protected landscapes, sites and biotopes.
3. National regulations.
  - 3.1. The environmental code.
  - 3.2. Decrees and application circulars.
4. The laws of conservation and classification on the scale of the biosphere.

**Personal work :**Seminar, outing (National parks: Tonga El-Kala, Belezma Batna)

**Mevaluation code:**examination, continuous monitoring

**Reference:**

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## **Title of the Master: Plant production and improvement**

Establishment: Mohamed Khider University

Title of the master: Plant production

Academic year: 2016-2017Page42

**Semester: S3**

**EU Title:UEFundamental 1**

**Title of the subject:Crop pests**

**Credits: 04**

**Coefficients: 02**

### **Objectives of teaching**

Students will acquire knowledge of the etiology of the main crop pests, sampling and diagnostic techniques as well as the methods envisaged for the fight against these pests.

#### **Recommended prior knowledge:**

Prior knowledge of zoology (animal biosystematics) and notions of botany and general ecology.

#### **Material content:**

1. Preliminary data on crop defense
  - 1.1. Importance of plant protection
  - 1.2. Role of plant protection
  - 1.3. Role of plant protection services
    - a. Inside the national territory
    - b. Facing the outside
2. Pests or animal parasites of crops
  - a. Arthropods - insects and mites
  - b. Nematodes
  - c. Rodents
  - d. The birds
  - 2.1. Pests of Cereals, Corn
  - 2.2. Sugar beet pests
  - 2.3. Pests of Legumes: Bean, Bean, Pea, Chickpea, Alfalfa
  - 2.4. Cucurbit Pests: Watermelon, Melon, Squash, Zucchini, Cucumber
  - 2.5. Solanaceae Pests: Tomato, Pepper, Eggplant, Potato
  - 2.6. Pests of Fruit Trees: Citrus, Peach, Almond, Apricot, Apple and Pear, Pistachio and Medlar and Olive
  - 2.7. Date palm pests
  - 2.8. Vine pests
  - 2.9. Pests of stored foodstuffs
3. Quarantine organisms and phytosanitary measures
4. Integrated management of crop pests

**Personal work :**Seminar, outing and/or others

**Mevaluation code:**examination, continuous assessment and practical work.

#### **Reference:**

- Phytosanitary protection of citrus fruits in Algeria
- Biological control methods orbiotechnical
- Protection of stored cereals and legumes
- Date palm pests
- Vine pests

# **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title: Fundamental EU 1**

**Title of the subject: Crop diseases**

**Credits: 04**

**Coefficients: 02**

## **Teaching objectives**

Students will acquire knowledge of the etiology of the main crop diseases, sampling and diagnostic techniques as well as the methods envisaged for the fight against these diseases.

### **Prior knowledge required**

Prior knowledge of animal biosystematics and microbiology, notions of botany and general ecology.

## **Content of the subject:**

### **I. -Different relationships between plants and parasites**

### **II. -The infection**

1. On the aerial parts of the plant
  - 1-1. The cuticle
  - 1-2. The phylloplan
  - 1-3. Germination
  - 1-4. Penetration
2. On underground parts
  - 2-1. Spores in the soil
  - 2-2. Root exudates

### **III. Host reactions**

1. Preformed substances
2. Predispositions
3. Defense mechanisms
  - 3-1. Structural means
  - 3-2. Biochemical means
4. Hypersensitivity

### **IV. Genetics of resistance**

1. Types of plant resistance to pathogens
2. Resistance (or sensitivity) according to age
3. Resistance depending on nutrition
4. The concept of "gene for gene"
5. Gain and loss of a resistor

### **V. Main diseases encountered on strategic crops in Algeria**

1. On fruit trees
2. On market garden crops
4. On cereals
5. On date palm

### **VI. Biotransmission of diseases by major pests**

1. Main vectors of fungal diseases
2. Main vectors of bacterial diseases and phytoplasmosis
3. Main vectors of viral diseases
4. Biotransmission factors

**Personal work:**Seminar, outing and/or others

**Evaluation Mode:**Examination, continuous monitoring and practical work

**References** (Books and handouts, websites, etc.).

## **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:UEFundamental 1**

**Title of the subject:**Weed science

**Credits: 04**

**Coefficients: 02**

**Goals** :know the specificities of field flora (origin, interest, economic, etc.). Know the methods of reproduction of harmful plants, the different systems for identifying harmful plants, means of combating harmful plants.

### **Content of the material:**

#### **Introduction: general information about weeds**

- Anthropological, ecological and weed definition of harmful plants
- Origin of weed flora
- Classification of harmful plants
- Agronomic nuisances

### **Chapter I: Evolution of weed composition**

#### **Introduction**

**Section 1:** Evolution of the weed composition according to edapho climatic conditions

**Section2:** Evolution of the weed composition depending on the cultivation techniques

**Section3:** Evolution of the weed composition according to their biological cycle

### **Chapter II: interference of harmful plants with crops introduction: concept of community and plant population**

**Section1:** competition of harmful plants with crops

**Section2:** allelopathy and other interference mechanisms

**Section3:** recognition of harmful plants in agro-ecosystems

### **Chapter III: fight against harmful plants**

**Introduction:** evolution of crop weeding methods

**Section1:** concept of integrated control

**Section2:** preventive measures

**Section3:** cultural techniques

**Section 4:** chemical weeding

**Personal work** :Seminar, outing and/or others

**Evaluation method:** examination, continuous assessment and practical work.

**Rferences:**

## **Title of the Master: Plant production and improvement**

**Semester:** S3

**Title of the EU:** Fundamental EU 1

**Subject title:** Abiotic stress in plants

**Credits:** 04

**Coefficients:** 02

### **Teaching objectives :**

Measurement and assessment of the effects of abiotic environmental factors on plant functioning and production.

**Recommended knowledge :** General biology, ecology, botany, plant physiology.

### **Module Content:**

I- The physiological translation of plants to environmental stresses

II- The main types of stress and the physiological responses of plants to different stresses

1- Physical factors

2- Water stress

3- Radiative factor

4- Edaphic and trophic factors

5- Other factors.

**Personal work:** Seminar, outing and/or others

**Evaluation method:** exam, continuous assessment and acts directed.

## **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:UEFundamental 2**

**Title of the subject:Special arboriculture and viticulture**

**Credits: 02**

**Coefficients: 01**

### **Teaching objectives**

Study of some strategic fruit species (morphology and physiology of the tree, varieties and rootstocks, phytosanitary control.....)

### **Content of the material:**

#### **Chapter I: the olive tree**

1. General ; 2-ecology of the olive tree; 3-morphology and physiology of the tree; 4-cultural techniques; 5-olive tree multiplication and plant production techniques; 6-phytosanitary protection

#### **Chapter II: citrus fruits**

1-systematic position; 2-morphology and physiology of the tree 3-ecological requirements; 4-varieties and rootstocks; 5-multiplication; 6-cultural techniques 7-phytosanitary protection

#### **Chapter III: seeded rosaceae: example of the apple tree**

1-systematic position; 2-morphology and physiology of the tree 3-ecological requirements; 4-varieties and rootstocks; 5-multiplication; 6-cultural techniques 7-phytosanitary protection

#### **Chapter IV: rosacea with stones: example: the apricot tree**

1-systematic position; 2-morphology and physiology of the tree 3-ecological requirements; 4-varieties and rootstocks; 5-multiplication; 6-cultural techniques 7-phytosanitary protection

#### **Chapter V: The vine**

1-systematic position; 2-morphology and physiology of the tree 3-ecological requirements; 4-varieties and rootstocks; 5-multiplication; 6-cultural techniques 7-phytosanitary protection

**Personal work** :Seminar, outing and/or others

**Evaluation method:** examination and continuous monitoring.

### **References**

# **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:EU methodology 1**

**Title of the subject:Planning and improvement strategies**

**Credits: 04**

**Coefficients: 02**

## **Teaching objectives**

Allow the student to develop improvement strategies and carry out varietal creation by managing the genotypic and environmental components and aiming for a specific improvement objective. Also the student will be able to opt for an appropriate selection scheme based on a set of elements allowing him to achieve his pre-formulated objective.

## **Recommended prior knowledge**

The knowledge that must already be acquired by the student essentially concerns the fundamental principles of biology and plant improvement and selection.

## **Content of the material:**

### **Chap 1: General information on improvement strategies**

1. General objectives
2. Multidisciplinary approach
3. Basic elements for planning an improvement strategy

### **Chapter 2: Types of Varieties**

1. Determining the type of variety to develop
  - 1.1. Selection scheme
  - 1.2. Mode of reproduction
2. Annual and perennial species
3. Qualitative traits
4. Quantitative traits
5. Definition of different types of varieties

### **Chapter 3: Selection schemes**

1. pure bloodlines
  - 1.1. Single seed descent
  - 1.2. Bulk method
  - 1.3. Pedigree method
  - 1.4. Bulk/pedigree method
  - 1.5. Modified pedigree method
2. Populations
  - 2.1. Features
  - 2.2. Mass selection
  - 2.3. Recurrent phenotypic selection
  - 2.4. Backcross
1. Hybrid varieties
  - 1.1. Theories of obtaining a hybrid
  - 1.2. Probability of obtaining heterosis



- 1.3. Selection scheme
  - 1.4. Backcross
  - 1.5. Hybrid seed production
2. Clonal varieties
  - 1.1. Features
  - 1.2. Selection scheme
3. Synthetic varieties
  - 1.1. Polycross test
  - 1.2. Cross test
  - 1.3. Selection scheme
4. Multiline varieties
  - 1.1. Features
  - 1.2. Backcross
5. Composite varieties
  - 1.1. Features
  - 1.2. Selection scheme

#### **Chapter 4: Crossover Plans**

1. Free Pollination
2. Polycross
3. Hierarchical device
4. Factorial device
5. Biparental device
6. Complete dial-up device

**Personal work** :Seminar, outing and/or others

**Evaluation method:**examination, continuous monitoring andTD.

**References**

**Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:UEMethodology 1**

**Title of the subject: Crop models**

**Credits: 02**

**Coefficients: 01**

**Teaching objectives**(Describe what skills the student is supposed to have acquired after passing this subject – maximum 3 lines).

*The objective of this subject is to introduce the student to the use of existing cultivation models and to introduce them to the world of technology in agriculture. The models will be used as decision support tools and allow them to understand how a model can facilitate the interpretation of experimental studies in time and space.*

**Prior knowledge recommended** (brief description of the knowledge required to be able to follow this course – Maximum 2 lines).

*The student is expected to know the computer tool (Excel) and basic elements in ecophysiology.*

**Content of the material:**

How a soil-plant-climate system works

    Relationship and flow

Concept of a culture model and its implementation

Classification of models

Culture model as decision support tools

    Vegetable production

    Phytosanitary treatment

    Yield simulation

**Personal work** :Seminar, outing and/or others

**Evaluation method:**continuous review and monitoring.

**References**

## **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:UEMethodology2**

**Title of the subject:HASinstrumental analysis**

**Credits: 04**

**Coefficients: 02**

### **Oteaching objectives**

Allow the student to master the main analysis techniques at plant and soil level.

### **VSPrevious knowledge recommended**

Basic notions of general, mineral and organic chemistry and physics, analytical chemistry, help the student to apply theoretical notions, by becoming familiar with measuring devices, and the main analysis techniques on plants and soil.

### **VScontent:**

1. General
2. Spectrometric methods
3. Electrochemical methods
4. Enzymatic methods
5. The pressure chamber; Leaf water potential
6. Other techniques

**Personal work** :exposed, and/or others

**Mevaluation code:**examination, continuous assessment and practical work.

### **References**

# **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:UEDécouverte1**

**Title of the subject:GIS and remote sensing**

**Credits: 02**

**Coefficients:02**

## **Objectives of teaching**

The objective is to master the basic concepts of GIS to be able to manage natural resources.

## **Recommended prior knowledge**

The student should have a prerequisite in topography and cartography.

## **Content of the material:**

### **Chapter I:**

Geographic information  
Acquisition and information  
Market databases

### **Chapter II:**

Cartographic representation systems  
shape of the earth  
Coordinate systems

### **Chapter III:**

Remote sensing and environmental application

## **Practical work (TP):**

- Use of open source software (e.g.:QGIS) or others (Mapinfo, arcGIS...etc)
- Georeference an image (registration)
- Selection by entities and attributes
- Spatial and attribute join
- Thematic analysis
- Layout

**Personal work** :exposed, and/or other

**Evaluation method:** examination, continuous assessment and practical work.

**References** (Books and handouts, websites, etc.).

# **Title of the Master: Plant production and improvement**

**Semester: S3**

**EU Title:EUTransversal 1**

**Subject title: Entrepreneurship and project management**

**Credits: 01**

**Coefficients: 01**

## **Teaching objectives**

The objective in Entrepreneurship is therefore to offer students a global vision of the different facets of entrepreneurship, its challenges, its risks and its characteristics.

## **Recommended prior knowledge**

Management, Economics-statistics

### **Chapter 1: The notion of entrepreneur and entrepreneurship**

Definition of Entrepreneurship

Entrepreneur characteristics:

Entrepreneurship in the economy

GEM Case Studies

### **Chapter 2: The entrepreneurial approach**

What is an opportunity?

Innovation

Why innovate and the obstacles to innovation

Key drivers of innovation

Market analysis

### **Chapter 3: The evolution of the company**

The growth

The internationalization of the company

### **Chapter 4: Idea, creation, development and after?**

The transmission

Recovery

Failure and second chances

### **Chapter 5: The business plan and partners**

The Business Plan

The partners

Analysis of an entrepreneurial theme with groups of students

## **Personal work: Presentations**

-Analysis of an accounting balance sheet- Development of technical sheets–

Calculates costs and cost prices and margins

Concept of yield and productivity and value

**Mevaluation code:**continuous monitoring + examination

## **References**

Entrepreneurship, Michel Coster, Pearson Education, 2009

Soparnot R.,2012-Business organization and management

Collection: Les Topos, Dunod - 2nd edition - 128 p.Soparnot R.,2009-Business management, Strategy. Structure. Organization.

## **V- Agreements or conventions**

**Yes**

**NO**

(If yes, transmit the agreements and/or conventions in the paper training file)

# STANDARD LETTER OF INTENT

**(In the case of a master's degree co-sponsored by another university establishment)**

**(Official paper on the header of the university establishment concerned)**

Subject: Approval of co-sponsorship of the master's degree entitled:

The university (or university center) hereby declares that it co-sponsors the above-mentioned master's degree throughout the accreditation period of this master's degree.

To this end, the university (or university center) will assist this project by:

- Giving his point of view in the development and updating of teaching programs,
- Participating in seminars organized for this purpose,
- By participating in defense juries,
- By working to pool human and material resources.

SIGNATURE of the legally authorized person:

FUNCTION :

Date :

# STANDARD LETTER OF INTENT

(In the case of a master's degree in collaboration with a company in the user sector)

(Official company letterhead)

**OBJECT** :Approval of the project to launch a master's degree course entitled:

Dispensed to:

The company hereby declares its willingness to demonstrate its support for this training as a potential user of the product.

To this end, we confirm our support for this project and our role will consist of:

- Give our point of view in the development and updating of educational programs,
- Participate in seminars organized for this purpose,
- Participate in defense juries,
- Facilitate as much as possible the reception of interns either as part of end-of-study theses or as part of tutored projects.

The means necessary to carry out the tasks incumbent on us to achieve these objectives will be implemented on a material and human level.

Mr. (or Madam).....is designated as external coordinator of this project.

SIGNATURE of the legally authorized person:

**FUNCTION :**

**Date :**

**OFFICIAL STAMP or COMPANY SEAL**