



UNIVERSITÀ DEGLI STUDI DI PALERMO

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| DEPARTMENT | Scienze Agrarie, Alimentari e Forestali | | |
| ACADEMIC YEAR | 2021/2022 | | |
| BACHELOR'S DEGREE (BSC) | PROPAGATION AND NURSERY MANAGEMENT IN THE MEDITERRANEAN ENVIRONMENT | | |
| INTEGRATED COURSE | SEED PRODUCTION AND HARVESTING AND PROPAGATION OF SPONTANEOUS SPECIES | | |
| CODE | 21715 | | |
| MODULES | Yes | | |
| NUMBER OF MODULES | 2 | | |
| SCIENTIFIC SECTOR(S) | AGR/02 | | |
| HEAD PROFESSOR(S) | CARRUBBA ALESSANDRA | Professore Associato | Univ. di PALERMO |
| OTHER PROFESSOR(S) | INGRAFFIA ROSOLINO | Ricercatore a tempo determinato | Univ. di PALERMO |
| | CARRUBBA ALESSANDRA | Professore Associato | Univ. di PALERMO |
| CREDITS | 8 | | |
| PROPAEDEUTICAL SUBJECTS | | | |
| MUTUALIZATION | | | |
| YEAR | 2 | | |
| TERM (SEMESTER) | 2° semester | | |
| ATTENDANCE | Not mandatory | | |
| EVALUATION | Out of 30 | | |
| TEACHER OFFICE HOURS | CARRUBBA ALESSANDRA Monday 09:00 12:00 Dip. SAAF (Agronomia); edif. 4, ingr L, 2° piano, stanza 209 Friday 09:00 12:00 Dip. SAAF (Agronomia); edif. 4, ingr L, 2° piano, stanza 209 INGRAFFIA ROSOLINO Monday 9:00 13:00 Viale delle Scienze, Ed. 4, ingr. L, piano 2, stanza n° 215 | | |

DOCENTE: Prof.ssa ALESSANDRA CARRUBBA

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| PREREQUISITES | Basic knowledge of Botany and Plant genetics |
| LEARNING OUTCOMES | <p>Knowledge and understanding - Acquisition of knowledge relating to biological, technical and regulatory aspects of seed production of crop and vegetable species. Acquisition of criteria and methods about selection, collection and propagation of wild medicinal and aromatic plants.</p> <p>Applying knowledge and understanding - Ability to design ex novo or carry out consultations on individual segments or on the entire chain of seed production as well as on the use of seed and wild-derived products, in particular at the nursery companies.</p> <p>Making judgments - Be able to suggest the adoption of technologies and devices to improve the qualitative and quantitative level and the efficiency of the seed company and of the utilization of seed and wild-derived products.</p> <p>Communication skills - Ability to expose, even to a non-expert public, aspects related to: enhancement and conservation of agro-biodiversity; utilization of seed products at the farms and nursery companies. Being able to use a simple and correct language in presenting the development projects, or to address the different figures of the seed chain and user companies (breeders, multipliers, seed companies and nurseries).</p> <p>Learning skills - The acquired knowledge will enable the student to interact with specialists in the field of multiplication of varieties of agricultural and vegetable species and to use effectively and autonomously the technical and scientific sources of the sector upgrade.</p> |
| ASSESSMENT METHODS | <p>Learning is assessed through an oral exam which consists of an interview. The questions (usually four-five), open or semi-structured, tend to test knowledge, acquisition of interpretative skills, the capacity of connecting and processing the topics, as well as a relevant presentation capacity. The final grade will be expressed in thirtieth: the minimum mark for passing the exam is 18/30; the maximum achievable mark is 30/30 with honours. The exam will be judged insufficient when the student will demonstrate: difficulty to focus on the proposed topics, shallow topic knowledge, and an extremely limited exposure ability. As the degree of details of the proven knowledge increases the grade will proportionally increase. The maximum score is obtained in case of excellent mastery and critical-interpretative capability of the course subject, fair exposition and use of a proper scientific terminology. The active and regular attendance during the lab activities held within the Integrated Course will be considered as an element for positive evaluation.</p> |
| TEACHING METHODS | Lectures, tutorials, laboratory, field and technical visits |

MODULE SEED PRODUCTION

Prof. ROSOLINO INGRAFFIA

SUGGESTED BIBLIOGRAPHY

E. Ciricofolo, P. Benincasa (2017) Sementi - Biologia, produzione e tecnologia. Edagricole, Milano. ISBN 978-8850655328
 L. Quagliotti (1992). Produzione delle sementi ortive. Edagricole. ISBN 8820624419
 L.O. Copeland, M.B. McDonald (2001). Principles of Seed Science and Technology (4th ed.). Springer-Verlag US. ISBN 978-0-7923-7322-3

Materiale bibliografico indicato dal docente durante il corso/Other literature suggested during the course.

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| AMBIT | 70243-Fondamenti di produzioni vegetali * |
| INDIVIDUAL STUDY (Hrs) | 68 |
| COURSE ACTIVITY (Hrs) | 32 |

EDUCATIONAL OBJECTIVES OF THE MODULE

The aim of the module is to provide the basic knowledge on seed development biology and on all aspects of the production of seed for field and vegetable crops (conservation and multiplication of varieties, agronomic aspects, normative and technology). The course will also provide knowledge about the connections and interdependencies between different segments of the seed production chain; all the information will constitute a fundamental tool for the design and consultancy to seed and nursery companies.

SYLLABUS

| Hrs | Frontal teaching |
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| 1 | Introduction to the module. Agronomic importance of quality seed. Role of seed industry in the agricultural sector. Seed chain and current situation of the seed sector. |
| 3 | Botanical and agronomic definition of seed. Development of seed. Seed structure. Aberrations of seeds. Vitality and deterioration. Factors affecting the vitality of the seed. Modifications in the seeds during storage. Germination. Phases and types of germination. Seedling structures. Dormancy. |
| 5 | Seed legislation. Guiding criteria of the seed chain. Definition of variety. The protection of plant varieties. National, EU and international regulations on the rights of the plant breeder. Requirements for registration in the National Register of varieties. Seed control and certification in Italy and in the EU. Technical and administrative procedures. Marking and labelling of packaging. Regional laws for cross-pollinated seed crops. Conservation varieties. |
| 2 | Official methods of seed analysis. Sampling. Determination of physical purity, moisture and number of weed seeds. Viability and vitality. Seed health. Analysis of the pelleted seed. Certificate of analysis. |
| 6 | Reproductive systems in cultivated crops. Conservation and multiplication of varieties of species: vegetatively propagated; mainly self-pollinated; mainly cross-pollinated. Agro-ecotypes and improved populations; pure lines; in equilibrium populations; synthetic varieties. Genetic and technical aspects of seed production of commercial hybrids. Large-scale seed production methods for hybrid varieties. "Synthetic" (or "artificial") seed |
| 5 | The specialized seed crop. Suitability of the production environment. Production areas. Environments other than those of origin of the variety. Agronomic aspects of seed production. Crop rotation. Isolation. Sowing time. Plant density and method of sowing. Particular systems. Soil fertility and fertilization. Irrigation. Weed control. Purification from off-type. Pollination and fruit set. Growth regulator. Crop protection. Management of seed crops of forage and cover species. Harvesting of seed crops. Period and method of harvest. Production of "organic" seeds: problems related to cultivation techniques and double certification. |
| 4 | The seed plant. Facilities for processing. Diagrams of selection. Drying. Theoretical bases and methods of use of the main seed selection machines. Handling and special seed treatments (calibration, coating, pelleting, dressing). Packaging. Storage under controlled conditions and in normal operating conditions. The contract of seed production. |
| Hrs | Practice |
| 1 | Seed analysis: moisture, physical purity, number of weed seeds, germination, etc. |
| Hrs | Others |
| 5 | Guided visits to the control and certification agency, seed production farms, seed companies. |

MODULE HARVESTING AND PROPAGATION TECHNIQUES FOR SPONTANEOUS OFFICINAL SPECIES

Prof.ssa ALESSANDRA CARRUBBA

SUGGESTED BIBLIOGRAPHY

- Catizone P., Barbanti L., Marotti I., Dinelli G. 2013. Produzione ed impiego delle piante officinali. Patron Editore.
- Marzi V., De Mastro G. 2008. Piante officinali. Coltivazione, trattamenti di postraccolta, contenuti in principi attivi, impieghi in vari settori industriali ed erboristici. Mario Adda editore.
- Basso F. 2009. Piante officinali, aromatiche e medicinali. Pitagora editrice.
- Monografie e articoli scientifici indicati dal docente.

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| AMBIT | 70274-Altre conoscenze utili per l'inserimento nel mondo del lavoro |
| INDIVIDUAL STUDY (Hrs) | 60 |
| COURSE ACTIVITY (Hrs) | 40 |

EDUCATIONAL OBJECTIVES OF THE MODULE

To provide detailed theoretical and practical information on the goals and the procedures to follow for a productive exploitation of the major herbs and shrubs growing wild in the Mediterranean environments, including selection of biotypes, collection and first management of propagation material, sowing/transplant and establishment, in the frame of farm multifunctionality and environmental and economical sustainability. By means of practical examples (case studies), and paying a special attention to direct learning, through practical individual activities in field and in lab, the major management techniques suitable to the different goals of cultivation will be taken into consideration, with a special regard to the effects on qualitative features of the obtained end-products.

SYLLABUS

| Hrs | Frontal teaching |
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| 1 | Goals and organization of the class |
| 1 | Herbs and shrubs growing wild in the Mediterranean environment. Food, medicinal, handicraft, aesthetic applications. Traditional uses and new perspectives. Goals of the cultivation of wild species. |
| 2 | Limits and constraints to the usual cropping techniques: scalarity of flowering/ripening; seed dispersal; biomass/yield ratio, effects of cropping techniques. |
| 2 | Collection of wild material; plant parts to collect and use. Sustainable collection and preservation of plant resources. Good agricultural and collection practices (GACP) |
| 2 | Goals and criteria for plant selection. Quality features and expected productions. |
| Hrs | Practice |
| 24 | Field and lab activities: collection of propagative material from natural and semi-natural areas. Selection, cleaning, preliminary operations, sowing/transplant and first plant management. |
| Hrs | Workshops |
| 2 | Case study: rosemary, wild populations and cultivation |
| 2 | Case study: wild fennel, effect of cultivation on the major traits of wild biotypes. |
| 2 | Case study: oregano, plant parts suitable for nursery. |
| 2 | Case study: wild Hypericum. |