# .- Field Crops

## Prof. Stefano Amaducci

***Text under revision. Not yet approved by academic staff.***

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course aims to provide students with the basic elements for the sustainable management of the cultivation of the most important full-field herbaceous species in Italian agriculture. The economic relevance and the main technical and commercial problems will be discussed for each species. Beginning with botanical and agronomic knowledge, the biological and cultural cycle of each species will be presented, identifying the dynamics of environmental needs, water and nutritional requirements as a function of the phenological phase. The determination of the product yield and quality will be presented and discussed in light of the effects of the environment and the agronomic technique on the crop's physiology and on the factors contributing to the yield. The knowledge provided will enable students to understand how the relationships between environment, genotype and agronomic technique influence the yield and quality of the main herbaceous species. Students will acquire the necessary knowledge for managing the main cultivation phases and for formulating water balances and the main nutrients.

***Intended learning outcomes:***

**Knowledge and ability to understand**

Upon completion of this course, students will be able to

* Describe the economic role and nutritional importance of the main field crops within the context of current and future agricultural challenges;
* Illustrate the biological cycle and describe the main phases of the crop cycle, identifying for each phase the influence that environmental and agronomic factors have on the composition of the yield and on the quality of the field crops;
* Understand the basics of the eco-physiology of the main field crops;
* Understand the environmental, economic and productive impact of the interaction between genotype, agronomic management and environment on field crops;
* Recognise the seeds of the main herbaceous species of agricultural interest.

**Understanding and applying knowledge**

At the end of the course, students will be able to:

* Apply their knowledge of production factors to formulating specific agronomic choices;
* Understand the factors that influence the water and nutrient balance of the main field crops and so develop effective fertilisation and irrigation plans.

**Autonomous judging skills.**

At the end of the course, students will be able to:

* Evaluate the main critical points of herbaceous production chains and suggest the most appropriate operational choices for the pursuit of specific production objectives.
* Understand the trade-offs underlying the main production choices in order to develop sustainable cultivation strategies;

**Communication skills**

At the end of the course, students will be able to:

* Appropriately use the scientific language and specific lexicon of field crops cultivation in order to describe and transfer their knowledge both in writing and orally.
* Address technical discussions on cultivation techniques and participate in supply chain roundtables.

**Learning ability**

At the end of the course, students will be able to:

* Extend their knowledge on all the herbaceous species, through the consultation of dedicated texts, scientific and popular journals, even beyond the aspects addressed in class.
* Learn and apply innovative agronomic management techniques.

***COURSE CONTENT***

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|  | ECTS |
| Introduction to the course. The importance of field crops in Italy and in the world: impact on the environment and availability of food for a growing population. | 1.0 |
| Cereals: botanical and agronomic characteristics that justify their primary role in agriculture in all countries.  Wheats.  Minor wheat cereals: barley, oats, rye, triticale.  Corn. Rice. | 4.5 |
| Industrial and alternative crops.  Sugar beet.  Biomass crops. | 1.0 |
| Forage crops: generalities.  Grass plants and types of herbaceous plants.  Forage species for monophytic and polyphytic, leguminous and grass pastures. | 1.5 |
| Tutorials  Calculation of nitrogen and water requirements for the main herbaceous crops. Introduction to precision fertilization and irrigation techniques.  Field visits | 1.0 |

***READING LIST***

“Coltivazioni erbacee 1” a cura di G.Mosca e A. Reyneri, 2023 Edagricole

*”Le piante foraggere”* S. Betti-M. Ligabue-V. Tabaglio*,* L’Informatore Agrario, Verona, 1992.

Further materials for in-depth study, together with the slides presented in class, will be provided during the course.

***TEACHING METHOD***

Frontal lectures, in which the main topics of the course will be addressed.

The tutorials will focus on the calculation of the water and nutritional balance (with particular reference to nitrogen) of the main crops treated during the course.

A half-day excursion will be organised to visit representative farms in the area.

The lectures will be held with the aid of PowerPoint presentations provided to the students before the lesson;

At the end of each chapter, a series of questions and sample exam questions will be presented.

***ASSESSMENT METHOD AND CRITERIA***

Final oral assessment, preceded by a written test in which the student will have to solve a problem relating to the calculation of the water or nutritional balance of a crop.

The oral exam consists of three questions, each of which carries a mark of between -10 and +10.

The exam is designed to assess primarily the student's reasoning ability and analytical rigour with respect to the course subjects, as well as their communication skills and command of the language.

***NOTES AND PREREQUISITES***

For admission to the oral exam, the student must have passed the General Agronomy exam.

Information on office hours available on the teacher's personal page at <http://docenti.unicatt.it/>.