Plant nutrition and soil fertility (IInd Year of study, IIIrd Semester)

Credit value (ECTS) 4

Course category
Domain (Imposed)

Course holder:
Assoc. Prof. PhD. Lucian RĂUS

Discipline objectives (course and practical works)

Acquiring thorough by future engineers agronomists the theoretical and practical issues on relationships soil - plant –fertilizer/ amendments, in close correlation with the control of the supply state with the nutrients of the soil and maintaining or the correction with fertilizers and amendments of the fertility status, through setting of doses judicious and differentiated economic optimum, for the purpose of yields quantitatively and qualitatively superior, effective economic and with the preservation of the environment.

Contents (syllabus)

Course (chapters/subchapters)
The object of study, the history and the importance of plant nutrition and soil fertility.
The foundations of agrochemicals of fertilization in relation to the requirements of plants The chemical composition of the plant. Classification of nutrients. The requirements of the plant in nutrients in relation to the species and age. Absorption root of the nutrients in the soil. State of supply it with nutrients.
Characterization of the soil system as a source of elements necessary for plant nutrition. Generalities. Fraction mineral of soil. The fraction organic soil .The complexes organo-mineral. Colloids of soil, the main factor of retention of nutrients. Processes of retention of nutrients. The reaction of the soil. The buffering capacity of the soil. The oxidation-reduction potential.
Correcting chemical reaction of soils by amendment. Correcting chemical reaction of acid soils. Correcting chemical reaction of saline and alkali soils.
Fertilizers as a means of increasing the fertility of the soil. Fertilizers - classification, production, consumption, trends. Chemical fertilizers with nitrogen. Chemical fertilizers with phosphorus. Chemical fertilizers with potassium. Fertilizers with macroelements of secondary order. Fertilizers with microelements. Complex chemical fertilizers. The retention of chemical fertilizers Organic fertilizers. Fertilizers and crop quality.
Control of the fertility status of the soil, means of rational use of fertilizers. Testing fertility status by chemical analysis of the plants. Testing fertility status by chemical analysis of the soils. Mapping agrochemical.
The principles of the rational and economic use of fertilizers. The determination of fertilizer doses.
Chemicalization intensive and the problems of pollution of the environment.

Practicum
Sampling of soil agrochemical and their preparation for the analysis
Improving the composition of the ionic of acid soils. Determine the forms of acidity in the soil. Determining the doses of lime amendments.
Improving the composition of halomorph soils. Determination of total alkalinity of soils. Determination of the sodium adsorbed in the soil. The establishment of doses of amendments with ghips.
Testing the soil fertility status. Dosage forms of nutrients into forms accessible for plants.
Recognition fertilizers. Chemical reactions qualitative to identify anions and cations of fertilizers.

References

1. **Ioan Avarvarei, M. Goian, V. Davidescu, R. Mocanu, C. Caramete, M Rusu**, 1997, *Agrochimie*, Editura Sitech, Craiova.
2. **Avarvarei, I., Volf Mariana**, 2006, *Metodologia recunoaşterii amendamentelor de sol şi a îngrăşămintelor chimice*, Editura „Ion Ionescu de la Brad", Iaşi.
3. **Budoi, Gh**., 2000, *Agrochimie, Solul şi planta*, Editura Didactică şi Pedagogică, R.A., Bucureşti.
4. **Lăcătuşu, R**., 2000, *Agrochimie*, Editura Helicon, Timişoara.
5. **Rusu. M. şi colab**., 2005, *Tratat de Agrochimie*, Editura Ceres, Bucureşti.
6. **Volf Mariana,** 2008, *Agrochimie*, Editura Renaissance, București.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	Oral examination	60%
Appreciation of the activity during the semester	Oral assessment during the semester, verification tests and final laboratory colloquium.	40%

Contact

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