Форма № Н - 3.04

NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of agrochemistry and quality of plant products

APPROVED
Dean of the faculty
_____ V. O. Zabaluyev
“_____”_____2017.

CONSIDERED AND APPROVED

By the collective of the Department
of agrochemistry and quality
of plant products
report № 12, 18.05.2017
Heard of Departament
_____ A. V. Bykin

SYLLABUS OF THE SUBJECT
Management of the quality of plant products in crop growth systems

Напрям підготовки:_ 090101 «Agronomy»
Спеціальність: Agronomy_____ Agronomy ____
Спеціалізація:_____
Факультет: __Agrobiological_____
Developer: assistant professor of the department, candidate of agricultural science
Nadia Bordyuzha

Київ – 2017

1. Description of the subject

The Management of quality of plant products__ in modern growing technologies_
(назва)

Field of the science, trend of the training, specialty, educational-qualification level		
Educational-qualification level	_____Bachelor___	
Trend of the training	090101 Agronomy (шифр і назва)	
Specialty	8.09010101 Agronomy (шифр і назва)	
Description of the subject		
Kind	selective	
Whole of hours	108	
Amount of ECTS	4	
Amount of moodles	4	
Undergraduate thesis (якщо є в робочому навчальному плані)	_____ (назва)	
Control	Exam	
Indexes of the subject for diurnal tuition and for tuition in correspondence course		
	diurnal tuition	tuition in correspondence course
Year of Training	____ III ___	_____
Semester	___V__	_____
Lectures	__15_	_____год.
Practis hours	_____	_____год.
Laboratory hours	___30__	_____год.
Individual hours	__48__.	_____год.
Individual tasks	_____	_____год.
Amount of week hours for diurnal tuition: audience hours Individual hours −	60 год. 48 год.	

2. The goal and task of the course

The goal of studying this subject ("the management of quality of plants products") is mastering theoretical and practical basis of agrochemical service of optimal conditions into growth of different plants sorts and is mastering theoretical and practical basis of

formation of growing products quality according to standards by students.

The task of the course is to build up the theoretical knowledge and practical skills of fertilizers application in crop rotation and determination of nutrients cycle on farm taken into consideration the zones of crop production and plants features and their sorts' characteristics. The knowledge of agricultural chemistry allow to provide the best conditions for plants nutrition taking into account fertilizers properties, their interaction with soil. Using knowledge of agrochemistry future specialist will be able to determine the most effective forms, terms and methods of fertilizers application.

Having studied this subject student have to know:

- basis trends of development of plantgrower in Ukraine and abroad;
- peculiarities of plants nutrition and factors of formation of high products yield and high quality of plants products;
- specific using of results of soil diagnostic and plant diagnostic;
- specific using fertilizers in drip irrigation;
- optimization of plant nutrition with fertigation;
- complex method of changing optimal level of plant nutrition;
- system of fertilizers application;
- standards to the fertilizers.

Students have to be able:

- to organize and to make sampling of soil and sampling of substrate and sampling of plant; to analyze its;
- to give recommendation about using macrofertilizers and microfertilizers under the authority of agrochemical analysis;
- to calculate the rates of fertilizers for basic application and top dressing;
- to correct content of nutrients into substrate and into nutrient solution;
- to organize service of agrochemical laboratory;
- to organize and to make agrochemical research in condition of greenhouses;
- to propose components of substrate; to propose optimal microclimatic regimes according to plants nutrition;
- to find out assortment of fertilizers and assortment of fertilizers providers and assortment of equipment providers.

3. Programme and structure of the course

Name of the moodle and topics	Amount of hours											
	diurnal tuition						tuition in correspondence course					
	whole	include					whole	include				
		l	p	lab		Ind w		l	p	lab		Ind w
1	2	3	4	5	6	7	8	9	10	11	12	13
Module 1. General principles of management of plant products in plant growing.												
Topic 1. Quality of plant products and system of management of plant products.						4						

Topic 2. Functional quality and hygienic quality and technological properties of plant products.		1		2		3						
Topic 3. General principles of management of plant products.						3						
Whole in module 1		1		2		10						
Module 2. Management of grain quality												
Topic 1. Management of grain quality of cereal.		2		4		8						
Topic 2. Management of grain quality of grainy.		2		2		3						
Topic 3. Management of grain quality of Leguminous.		2		2		4						
Whole in module 2		6		8		15						
Module 3. Management of industry crops.												
Topic 1. Management of quality of oil crops.		2		2		4						
Topic 2. Management of quality of Sugar beet.		2		10		6						
Topic 3. Management of quality of Flax.		2		2		4						
Whole in module 3		6		14		14						
Module 4. Management of vegetables quality												
Topic 1. Management of quality of Potato.		2		4		3						
Topic 2. Management of quality of Fruits and vegetables.				2		4						
Whole in module 4		2		6		7						
Whole		15		30		75						
Undergraduate thesis _____ (якщо є в робочому навчальному плані)		-	-	-		-		-	-	-		-
Whole	120	15		30		75						

4. Topic of the laboratory classes

N п/п	Topic	amount of hours
1	The determining of quality of gluten in grain of winter wheat.	4
2	Laboratory analysis of bred	2
3	The analysis in determination of stach with optical method.	4
	The determination of acidity in grain	2
4	The analysis in determination of saccharose with optical method.	4
5	The determination of a-amino-nitrogen into sugar beets with photometric method.	4
6	The determination of content of raw fat with method of defatted	4
7	The determination of vitamin C into vegetables.	2
8	The determination of carotin into carrot.	2
9	The determination of general acidity in vegetables and ftuts.	2
	Amount	**30**

5. Control questions, test blok for determination of the level of the student knowledge

1. Management of quality of the sugar beet.
2. Management of the quality of the rape.

Test blok

	1. What are the basic tasks of technologies of management of quality of plant products?
1	The provision of conditions of plant growing according to its biological needs for getting high yield with high quality.
2	The provision of users needs to quality of plant products.
3	The adaptation of plant growing technologies to regional climatic conditions.
4	The optimization of resource provision of plant growing technologies.

75	2. Which standards must field have when potato is grown for chips on this field?
1	The absence of nematodes
2	High level of soil water
3	Same any standards are absent
4	Absence of soil insects and perennial weeds.

100	3. Which optimal content of physical clay must soil have if potato is grown for remaking on it?
1	

75	4. Why heavy soil is not optimal soil under growing of potato for remaking?
1	The yield include a great number of deform tubers and great number of untypical tubers and great number of damage tubers.
2	Does not provide optimal water regime
3	There are difficulties during planting and looking for and harvesting

4	The problems are coming in plant nitrogen nutrition and plant potassium nutrition

50	5. the best predecessor crop under potato is
1	Winter wheat
2	maize
3	potato
4	alfalfa

100	6. The plots that have very many weeds and that are using to grow potato need:
1	To till it and to cultivate it after 1 month.
2	To remove the stubble of predecessor plants in 1 or 2 events
3	To bring in whole covering herbicides after harvesting of predecessor plants
4	To cultivate soil in spring

100	7. The basic fertilization of potato need on light soils:
1	To deny from nitrogen application in autumn and maybe to apply rock phosphate meal in full rate and potassium fertilizers with a little of chlorine in 70-80% rate
2	To deny to nitrogen and phosphate fertilizers application but to apply potassium fertilizers beyond the control of form
3	To apply fertilizers without restriction and according to plan rates
4	Do not apply only liquid kinds of fertilizers

75	8. How many the fertilizers have to apply In basic application on dark-grey opodzolic soil under potato?
1	All elements have to apply in 70-80% of rate
2	All elements have to apply in 100% of planning rate
3	20 kg/ha of active matter of all elements
4	N-0-30, PK-70-80% from rate

100	9.Is it possible to change autumn ploughing on no-till tilage in growing of potato?
1	Yes, it is possible with on no-till tilage in deep 30-35 cm on middle granular types of soil
2	Yes it is possible without ridge- growing of potato
3	Under no circumstances
4	Yes it is possible if perennial weeds are absent in field.

75	10 The need of closing down of moisture in spring is causing with
1	Improving of water-air regime of soil
2	Saving of moisture in early spring time
3	Saving of moisture and it effect on quality of potato
4	Ability of speed up planting of potato because soil was warmed thoroughly

6. Methods of studied

1. visual;
2. laboratory;
3. practice, etc.

7. Control

The protection of laboratory results and tests

8. Range of the balls for students

National mark	ECTS mark	The definition ECTS mark	Student rating, balls
1	2	3	4
five	A	**Perfectly** – test paper are done perfectly with same mistakes	90-100
four	B	**Well done** – higher than intermediate level with same mistakes	82-89
	C	**Well** – the correct test paper in generally with same blunders	75-81
three	D	**Satisfactory** – the test paper are done not bed but it include number of drawbacks	66-74
	E	**Pretty well** – the minimal roles are followed	60-65
two	FX	**Bed** – student has to study for testing	35-59
	F	**Very bed** – student has to study heavy	01-34

Student activity			Ball	Deal of the module
Module 1			**100**	**5**
T1	Quality of plant products and system of management of plant products.		30	
T2	Functional quality and hygienic quality and technological properties of plant products.		40	
T3	General principles of management of plant products.		30	
Module 2			**100**	**40**
T4	Management of grain quality of cereal.		5	
	Л1	The determining of gluten content in grain of winter wheat.	10	
	Л2	The determining of quality of gluten in grain of winter wheat.	10	
	Л3	Laboratory analysis of bred	10	
T5	Management of grain quality of grainy.		5	
	Л4	The determination of acidity in grain	10	
T6	Management of grain quality of Leguminous.		5	
	Л5	The analysis in determination of saccharose with optical method.	10	
Module 1			35	
Module 3			**100**	**30**
T7	Management of quality of oil crops.		5	
	Л6	Determination of the raw fat	10	

Т8	Management of the quality of the sugar beet		5	
	Л7	The technological indexes of the sugar beet	10	
	Л8	Determination of the a-amino-nitrogen in sugar beet	10	
Т9	Management of the quality of the flex		5	
Module 2			55	
Module 4			**100**	**25**
Т10	Management of the quality of the potato		5	
	Л9	Determination of the vitamin C in vegetable	10	
Т11	Management of the quality of the vegetable		5	
	Л10	Determination of the vitamin A	10	
	Л11	Determination of the acidity of the vegetable	10	
Module 3			60	
Educational work			**100**	**70**
Exam			**100**	**30**
Сума			**100**	**100**

8. Методичне забезпечення

1. Agricultural Chemistry: Manual / M.M. Gorodniy, I.V. Prystash, P.M. Kyveryga. – K, 2007. – 234 p.

2. Agricultural Chemistry: Manual to lecture classes / I. V. Loginova., N. P. Bordyuzha. – K: СОМПРИНТ, 2012. – 75 p.

3. Agrochemical Analysis: Manual to laboratory work / I. V. Loginova., N. P. Bordyuzha. – K: СОМПРИНТ, 2012. – 75 p.

9. Recommended literature

Basic literature

1. Управління якістю продукції рослинництва: методичні вказівки до вивчення дисципліни. / І.У Марчук, Н.М. Бикіна, Н.П. Бордюжа. – К.: 2013. – 84 с.
2. Прикладна біохімія та управління якістю продукції рослинництва. Городній М.М. Мельничук С.Д., Гончар О.М. та ін. / за ред. М. М. Городнього. – К.: Аристотель, 2005. – 484 с.
3. Управління якістю продукції рослинництва. Городній М.М., Кохан С.С., Матасар І.Т. та ін / За ред Городнього М.М. К.: Вид центр НАУ. 2001 243 с.

Additional literature

1. Агрохімічний аналіз: підручник. / М.М. Городній, А.П. Лісовал, А.В. Бикін та ін. / За ред.. М.М. Городнього. – К.: Аристотель, 2005. – 456 с.
2. Добрива та їх використання: Довідник / [І.У. Марчук, В.М. Макаренко, В.Є. Розстальний та ін.]. – К., 2011. – 245 с.
3. Система застосування добрив: под ред. А.П. Лисовала. – К.: Вища школа, 2002. – 317 с.
4. Козлов М.В. Агрохімічне забезпечення високопродуктивних технологій вирощування зернових культур / М.В. Козлов, А.А. Плішко. – К.:Урожай", 1991. – 232 с

5. Кулаковская Т.Н. Почвенно-агрохимические основы получения высоких урожаев / Т.Н. Кулаковская. – Минск: Урожай, 1978. – 272 с.
6. Науково-методичні рекомендації з оптимізації мінерального живлення сільськогосподарських культур та стратегії удобрення / [М.М. Городній, О.І. Бондар, А.В. Бикін та ін.]; за заг. ред. М.М. Городнього. – К.: ТОВ "Алефа", 2004. – 140 с.
7. Озимі зернові культури / [Л.О. Животков, С.В. Бірюков, Л.Т. Бабаянець та ін.]; за ред. Л.О. Животкова і С.В. Бірюкова. – К.: Урожай, 1993. – 288 с.
8. Ягодин Б.А. Агрохимия / Б.А. Ягодин, Ю.П. Жуков, В.И. Кобзаренко. – М.: Колос, 2002. – 584 с.
9. Mitchel S.D. The basis for food production nutrients / S.D. Mitchel, 1985. –589 p.

10. Інформаційні ресурси

1. Computer programs: AGROSTAT, PANORAMA

CONTENT OF SUBJECT

Program of the course

Module 1. General principles of management of plant products in plant growing.

Topic 1. Quality of plant products and system of management of plant products. The subject and task of course in management of quality of plant products. The meaning of course for agriculture such as factor for management of quality. Protect of environment and fertilizers application. The understanding of yield quality. Biological quality of products. Technological quality of products. Hygienic quality of products. The basic of sound nutrition. The prospects in developing of this course. Role nutrients and basic of sound nutrition. Quality of products and its kinds. The basic characteristics of biological and biochemical and technological quality of products.

Basic of standardization in plantgrower. The kinds of standards for plant products. Organization of control in product quality. State system of certification and control of product quality.

Topic 2. Functional quality and hygienic quality and technological properties of plant products. Proteins. Food value of its. Classification of proteins. The mean of every fraction of proteins in nutritive value of protein. Protein-gluten complex. Fat and lipids for people. Fat acids. Role of lipids in energetic metabolism. Carbohydrates. Role of its for metabolism. Water-soluble vitamins. Classification. Vitamin C (ascorbic acid). Sources of taking. The ways decreasing of losses it during cooking. Vitamin B. Role in carbohydrate metabolism. Vitamin B12. Vitamin PP. Vitamin B3. Vitamin B6. Vitamin B12. Role in blood formation process. Vitamin B7. Role in metabolism. Soul nutrition.

Topic 3. General principles of management of plant products. Quality of basic crops in Ukraine. Growing of high full value quality products. Control and admission of products. The influence of soil conditions and climatic conditions and effect of chemicalization means and of growing technologies and of sort on quality of plant products.

Module 2. Management of grain quality

Topic 1. Management of grain quality of cereal. Graun industry in Ukraine. Food value of bread and bun. Vitamins in bread. Physical quality of grain of winter wheat. Specific weight of grain. Weight of 1000 seeds. Contamination by insects. Biochemical value and food value of grain. The effect of mineral nutrition on Content of protein and content of glutan in grain. Amino acids composition of grain protein. Ash content of grain. Technological quality of grain. Quality of row gluten. Classification of gluten. Bre4ad-making quality of wheat four. Quality of dough. Soil condition and temperature regime and moisture of air and quality of wheat grain. Correcting of nitrogen fertilizer rates according to recovery of spring vegetation of winter plants. Role of sort in formation of grain quality. Using od plant diagnostic for find out need in foliar application of wheat. Split application of nitrogen fertilizers. The effect of late nitrogen fertilizer application after planting. The effect of late microelements fertilizer application after planting. The influence of chemicalization on quality formation of grain. Nutritious Balance for growing of winter wheat and for spring wheat.

Spring barley and winter barley. Chemical composition of grain of barley.

Technological properties of barley grain for groats industry. The standards to malting barley. The difference in quality of goat barley and of forage grain. The growing of malting barley.

Corn. It using such as fodder crop and as technical crops. Bochemical composition. The effect of mineral and organic fertilizers on its quality. Terms and methods of fertilizer application. Its effect.

Topic 2. Management of grain quality of grainy. Goats plants. biochemical quality of buckwheat and millet. The improving of quality of millet and of buckwheat under using of organic and mineral fertilizers.

Topic 3. Management of grain quality of Leguminous. Leguminous plants in agroculture. The quality of leguminous plants. Bochemical composition. The effect of mineral and organic fertilizers on its quality. Inoculation of grain.

Module 3. Management of industry crops.

Topic 1. Management of quality of oil crops. Sunflowers . biochemical composition of seeds. Physical and chemical properties of sunflower oil. Gropes of sunflower seeds according to acid value. Climatic effect and fertilization effect and quality of seeds. Micronutrition.

Topic 2. Management of quality of Sugar beet. The industry of sugar in Ukraine. The nutrition of sugar beet. Chemical composition of beets. Standards to storage of sugar beet. Technological quality of beets. The technology of sugar production. A-amino-N. Rafinate sugar yield. Good quality of sugar. The effect of weather on sugar content. physiological basis of increasing of sugar content. The influence of fertilizers on it. Rates and doses and terms and methods of fertilizer application. microfertilizers. Irrigation.

Topic 3. Management of quality of Flax. The qualitative indexes of flex. The fertilizer using in growing technology of flex.

Module 4. Management of vegetables quality

Topic 1. Management of quality of Potato. Chemical composition of beets. Carbohydrates in tubers. Darkening of potato. The organic and mineral fertilizers in growth of potato. Liming.

Topic 2. Management of quality of Fruits and vegetables. Biochemical composition and qualitative indexes of its products. The influence of weather on formation of quality this crops. The effect of fertilization on quality of fruits and vegetables. Liing and microelements.