

CONTENTS

CHAPTER 1

THE ROLE OF NICHE CULTURES IN THE CONDITIONS

OF CLIMATE CHANGE (Borovyk V. O., Maltseva O. P.) 1

1. Economic importance of guar and justification of its study 4
2. Results and perspectives of research on the gene pool of guar samples 6

CHAPTER 2

B THE INFLUENCE OF CLIMATE CHANGE

ON THE SUNFLOWER CROP IN THE SOUTHERN STEPPE

OF UKRAINE: MODELING AND ANALYSIS

(Vozhehova R. A., Zhygailo T. S., Zhygailo O. L.)..... 18

1. Modeling the influence of agroclimatic conditions to sunflower productivity 20
2. Analysis of the climate changes influence to agroclimatic conditions and sunflower productivity 27

CHAPTER 3

SCIENTIFIC BASE OF FORMING CLIMATE-SMART CROP

ROTATIONS ON IRRIGATED SOILS (Vozhehova R. A.)..... 36

1. Impact of Primary Soil Cultivation Systems on the Accumulation of Effective Soil Moisture..... 41
2. The impact of research factors on soil humus..... 42
3. The activity of soil microorganisms depends on the tillage systems 44
4. Influence of Soil Tillage Systems on Soil Salinity and Alkalization 47
5. Formation of crop yield depending on the researched factors 49
6. The economic efficiency assessment of climate-smart crop cultivation technologies in crop rotations under irrigation 54

CHAPTER 4

PAWPAW, PERSIMMON, UNABI ARE REAL – PROMISING

UNCOMMON FRUIT CROPS IN THE SOUTH OF UKRAINE

(Hrabovetska O. A.)..... 59

1. Pawpaw (*Asimina triloba* (L.) Dunal)..... 61
2. Persimmon (*Diospyros* L.)..... 67
3. Unabi is real (*Ziziphus jujuba* Mill.)..... 78

CHAPTER 5

HEAT STRESS IN DAIRY CATTLE

(Danchuk V. V., Antonik I. I., Danchuk V. O.)	84
1. Impact of climate change on the agroecosystem and dairy farming	85
2. Thermal homeostasis and its regulation.....	86
3. Heat stress of dairy cows	89

CHAPTER 6

HEAT STRESS OF BEEF CATTLE

(Danchuk O. V., Zaruba K. V.)	109
1. Feeding systems and animal welfare	110
2. Livestock monitoring models for animal welfare and productivity	112
3. Biological mechanisms of heat stress development in beef cattle	114
4. Heat stress and beef cattle breeding in Ukraine	122

CHAPTER 7

AGROCLIMATIC ASSESSMENT OF THE IMPACT OF CLIMATE CHANGE ON THE THERMAL RESOURCES OF THE NORTHWESTERN BLACK SEA REGION

(Zaiets S. O., Volvach O. V., Yuzyuk S. M.)	132
1. Methods of assessing the heat supply of territories	133
2. The current state of research on thermal resources of the territory of agricultural production	134
3. Agroclimatic assessment of thermal resources of the territory Odesa region	140

CHAPTER 8

ESTIMATION OF DIFERENT METHODS OF GRPWING CARROT SEEDS (*DAUCUS CAROTA* L.) UNDER DROP IRRIGATION IN SOUTHERN OF UKRAINE

(Kosenko N. P., Knysh V. I., Kokoiko V. V.)	152
1. Analysis of previous studies of methods of carrot seed production.....	153
2. Improvement of methods of growing carrot seeds by transplanting mother roots.....	156
3. Improvement of methods of growing carrot seeds by non-transplanting mother roots.....	160

CHAPTER 9

MORPHOLOGICAL PARAMETERS OF CORN HYBRIDS FROM DIFFERENT FAO GROUPS DEPENDING ON TECHNOLOGICAL ELEMENTS UNDER DRIP IRRIGATION

(Lavrynenko Yu. O., Netroba O. O.)..... 170

1. Biometric indicators of corn hybrids of different FAO groups depend on the elements of technology 170
2. Grain yield of maize hybrids of different FAO groups under irrigation conditions 177

CHAPTER 10

GENOTYPE-ENVIRONMENTAL RESPONSE OF INBRED LINES – PARENTAL COMPONENTS OF MAIZE HYBRIDS IN CHANGING CLIMATE CONDITIONS

(Marchenko T. Yu., Piliarska O. O.)..... 184

1. Leaf area index (LAI) is a crucial factor when it comes to maize hybrid parental components, and it depends on various research factors..... 187
2. Photosynthetic Potential of Maize Hybrid Parental Lines Depending on Experimental Factors 190
3. The Impact of Plant Density and Biopreparations on Seed Yield Formation in Maize Parental Lines Under Irrigation 192
4. Laboratory Similarity of Seed in Maize Hybrid Parental Lines 194
5. Seed Yield of Maize Hybrid Parental Components Depending on Plant Density and the Action of Biological Preparations 195

CHAPTER 11

RESOURCE-SAVING TECHNOLOGIES FOR GROWING OILSEED FLAX IN THE SYSTEM OF ADAPTATION TO CLIMATE CHANGE IN THE ZONE OF INSUFFICIENT MOISTURE

(Rudik O. L., Onufran L. I.) 202

1. *Linum usitatissimum* in the system of measures to optimize oilseed production 203
2. Rational use of resources as an element of modern technologies for growing oilseeds 204
3. Directions of use of oil flax and features of technologies for its cultivation 206

CHAPTER 12

RESULTS OF INTRODUCTION AND SELECTION OF VARIOUS SPECIES OF NICHE AROMATIC PLANTS IN THE SOUTHERN

STEPPE (Svydenko L. V., Hudz N. I., Svydenko A. V.).....	225
1. <i>Genus Monarda</i> L.....	227
2. <i>Genus Thymus</i> L.....	232
3. <i>Genus Satureja</i> L.....	236

CHAPTER 13

ROLE OF ALTERNATIVE SPLICING IN CHICKPEA (*CICER ARIETINUM* L.) DROUGHT TOLERANCE MECHANISM, REVEALED VIA TRANSCRIPTOME ANALYSIS

(Slisichuk H. I., Volkova N. E.).....	242
1. Materials and methods.....	244
2. Results.....	245
3. Discussion.....	249

CHAPTER 14

THE IMPORTANCE OF THE ROOT SYSTEM IN THE MANIFESTATION OF ADAPTABILITY TO ABIOTIC STRESS FACTORS

(Tyshchenko A. V., Tyshchenko O. D., Koblai O. O.).....	256
1. Morphological structure of the root system of alfalfa populations.....	258
2. Selection value of the diameter of the main root.....	263
3. The influence of inoculation and re-regulating drugs on the accumulation of root mass of alfalfa.....	268

CHAPTER 15

OPTIMIZING NUTRITION OF PEAS UNDER WINTER SOWING UNDER CLIMATIC CHANGES OF THE STEPPE ZONE

OF UKRAINE (Burykina S. I., Serhieiev L. A., Uzhevskaya S. P.).....	290
1. The problems prerequisites emergence and the problems formulation..	291
2. The analysis of existing methods for solving the problem and formulating a task for optimizing nutrition of peas for winter sowing.....	292
3. Conditions and methods of conducting research.....	294

4. Formation of productivity and quality production of peas under winter sowing by feeding systems	298
5. Economic efficiency of winter sowing pea nutrition systems.....	312

CHAPTER 16

ADAPTIVE SELECTION OF GRAIN CROPS IN THE CONDITIONS OF THE SOUTH-EASTERN STEPPE OF UKRAINE

(Vyskub R. S., Vashchenko V. V., Bondareva O. B.).....	326
1. Selection of winter wheat varieties according to adaptability and productivity indicators	328
2. Genetic features of spring barley varieties in terms of productivity and its structure.....	336

CHAPTER 17

THE INFLUENCE OF ANTHROPOGENIC AND CLIMATE FACTORS ON THE FORMATION OF THE QUALITY OF SPRING BARLEY PRODUCTS IN THE CONDITIONS OF THE SOUTH-EASTERN STEPPE OF UKRAINE

(Vinyukov O. O., Bondareva O. B., Chuhrii H. A.)	345
1. Conditions and methods of conducting research	348
2. The effect of microbial preparations and plant growth regulators on the accumulation of heavy metals in spring barley plants	351
3. Study of the influence of climatic factors on the formation of the quality of spring barley products	354

CHAPTER 18

CROP ROTATION AS A MEASURE OF RESOURCE SAVING AND ENVIRONMENTAL BALANCE IN THE SOUTHERN REGION OF UKRAINE IN THE POST-WAR PERIOD (Hamaiunova V. V., Khonenko L. H., Baklanova T. V., Pylypenko T. V.).....

.....	361
1. Available organic matter is a guarantor of reproduction of soil fertility and sustainable productivity of crops.....	363
2. The modern paradigm of nutrition and selection of crops for climate change.....	379

CHAPTER 19

INITIAL ASSESSMENT OF VIRGIN AND OLD-GROWTH FORESTS IN THE GORGANY NATURE RESERVE

(Klid V. V., Petrashchuk Ya. V.) 394

1. Retrospective review of literature on the expansion and conservation of old-growth and virgin forests 396
2. Valuable natural objects and typological structure of forest stands in the Gorgany Nature Reserve 399
3. Analysis of the typological and forestry-taxation structure of virgin forests in the Gorgany Nature Reserve 403

CHAPTER 20

FORMATION OF EGGPLANT YIELD UNDER THE INJECTION IRRIGATION SYSTEM IN THE CONDITIONS OF THE

NORTHERN STEPPE OF UKRAINE (Kovalov M. M.)..... 412

1. Dynamics of the formation of vegetative and root mass of eggplants according to the experiment options 413
2. Duration of the growing season of eggplant plants in connection with changes in the water regime of the soil and doses of fertilizers..... 419
3. The influence of the water regime of the soil, doses of fertilizers and the level of photosynthetic activity on the formation of the yield of eggplants 423
4. Ecological assessment of eggplant cultivation with irrigation using injection drip irrigation systems 431

CHAPTER 21

YIELD AND GRAIN QUALITY OF WINTER WHEAT AND WINTER BARLEY DEPENDING ON SOWING DATES IN SOUTHERN UKRAINE

(Kohut I. M., Pochkolina S. V., Serhieiev L. A.) 438

1. Grain yield of winter wheat and barley under different abiotic conditions 441
2. Grain quality of winter wheat and winter barley varieties at different sowing dates 443
3. Economic efficiency of winter wheat and winter barley grain production under different abiotic conditions 450

CHAPTER 22

CLIMATE-ORIENTED BREEDING OF INDUSTRIAL HEMP

(Mishchenko S.V.)	455
1. Breeding and genetic innovations in hemp growing	456
2. The latest methodology for the industrial hemp breeding.....	462
3. Separate methodical techniques and methods of climate-oriented industrial hemp breeding	469
4. Industrial hemp <i>in vitro</i> culture.....	475

CHAPTER 23

THE INFLUENCE WEATHER CONDITIONS ON WINTER RAPE'S INDICATORS OF THE SUITABILITY VARIETIES FOR DISTRIBUTION IN UKRAINE

(Orlenko N. S., Zolotar O. V., Likar S. P.)	489
1. Research analysis, problem formulation, solution's materials and methods.....	490
2. Characteristics of the winter rapeseed varieties collection, which were included in the Ukrainian State Register	493
3. Analysis varieties suitability indicators for distribution with relation to weather conditions	494

CHAPTER 24

CARBON NANOMATERIALS AS REGULATORS OF STRESS RESISTANCE IN PLANTS

(Prylutska S. V., Tkachenko T. A., Klepko A. V.)	502
1. The mechanisms of penetration of carbon nanoparticles into plant cells and their influence on physiological and biochemical processes	503
2. Stress resistance of various types of plants after the action of carbon nanoparticles.....	512

CHAPTER 25

THE STRUCTURE OF THE ENTOMOCOMPLEX OF PEAS UNDER WINTER SOWING IN THE SOUTH OF UKRAINE

(Serhieiev L. A., Uzhevskaya S. P., Burykina S. I.)	530
1. Material and methods.....	531
2. Results	533

CHAPTER 26

**GENETIC ASPECT OF SOLVING ENVIRONMENTAL PROBLEMS
OF ANIMAL HUSBANDRY BY REDUCING THE INCIDENCE
OF NECROBACTERIOSIS IN CATTLE**

(Suprovych T. M., Karchevska T. M., Laiter-Moskaliuk S. V.) 547

1. BoLA-DRB3 gene: structure, function, polymorphism 550

2. Identification of BoLA-DRB3.2 alleles associated
with necrobacteriosis 553