CONTENTS

Prefac	Croim to the second of the sec	7
1.	Some problems of biomathematical theory	9
1.1	Basic biomathematics	9
1.1.1	The range of problems in biomathematics	9
1.1.2	The approximation of biological processes by mathematical models	10
1.1.3	"Biological time": the role of time in biological investigations	12
1.1.4	Elementary mathematical symbols	13
1.1.5	Some methods of mathematical verification from a biological point of view	14
1.1.6	Multidimensional metric spaces	15
	Definitions of major biological concepts	15
	Biological states and the metric space	16
1.1.7	Functions or projections in biology	20
1.1.8	Some types of projections in biology	?1
	Continuity, limitedness, differentiability and integrability of projections	
1.1.9	The notion of biomathematical effect in biological examinations	27
1.2	Mathematical approximation of probabilistic processes in biology on the basis of a set of	21
1.2	observed data	22
1.2.1	Random variables	32
	Biological state and Kolmogorov's elementary event	32
1.2.2	Distribution and parameters of random variables	32
	Normal distribution of probabilities	33
	Check of normality	35
	Lognormal distribution of probabilities	36
	Empirical distribution and density functions	37
1.2.3	The basic computational method of the classical regression analysis in biology	37
1.2.4	Probit-transformation	38
1.2.5	Stochastic approximation	42
1.2.6	The Moor-Roxer procedure, a variational method for the determination of the regression	44
1.2.0	function	45
1.2.7	Regressional interval-function	
1.2.8	Approximation of a set following in different sections different types of functions by polynomials	46
1.2.8.1		48
1.2.8.2		49
1.2.9	Regression function with several variables using the arc length as auxiliary variable	50
	Approximate integration	53
1.3	Biological defect of the regression analysis based on the least squares principle	56
1.4	Role of cognizability limit in detecting the changes of biological state	58
1.4.1	Connections among the biopotentials of plants measured as functions of treatment time and	59
1.7.1	continuity time	61
1.4.2	Mathematical approximation for the comparison of the characteristics of a living organism	01
1	exposed to a given influence and the characteristics of a control living organism	64
1.4.3	Method for the mathematical solution of the sets with extreme variations, the so-called "saw-	04
1.1.5	tooth" sets	66
1.4.4	Determination of the overlapping probability of sets with two variables	68
1.5	Comparison of sets characterizing biological states on the basis of magnitude-relation	70
1.6	A multivariable examination method with relative coordinates	77
1.7	Evaluation of the effect of a treatment using modulation with respect to control	82
1.7.1	The biological interpretation of the practical problem of plant protection	82
1.7.2	Examination of the effect of a treatment	83

2.	Examples of the mathematical solution of problems in plant protection	93
2.1	Determination of optimum sampling rate	93
2.1.1	Determination of the optimum sampling rate for smut infection and European corn borer	
	damage	94
2.1.2	Determination of the optimum sampling rate for the investigation of spray-drop number	100
2.2	Study of the effectivity of plant protection	101
2.2.1	Study of the connection between average yield and plant protection costs	101
2.2.2	Study of the connection between the number of plant protection treatments and the proportion	
	of exportable fruit	108
2.2.3	Trend of farm management indices of raspberry production as a function of plant protection	
	costs	112
2.2.4	Study of optimization of natural and artificial production factors	116
2.3	Investigation of the ecological requirements of damaging or infectious living organisms	125
2.3.1	Investigation of the connection between ecological conditions and density of individuals of pest	
	insects in store houses	125
2.3.2	Investigation of the ecological requirements of the late blight of potatoes and the possibility of a	
	mathematical prediction	137
2.4	Study of the effect of chemicals	147
2.4.1	Dose determination of sodium pentachlorophenol protecting Scotch fir against Coniofora	
	cerebella et com a la sandord assert la manufactura de cerebella	147
2.4.2	Determination of the effect of a chemical in the case of warm-blooded animals	152
2.4.3	Approximate practical determination of the mortality index using modulation according to	
	the control	154
2.4.4	Uniformization of field and laboratory tests on the effect of chemicals	174
2.4.5	Weight of a fungus culture treated by electromagnetic radiation and of an untreated culture	181
2.5	Study of the distribution of dimensions by approximate practical distribution functions	183
2.5.1	Distribution of the weight of potato seeds for two different methods of production	183
2.5.2	Study of the distribution of leaf areas of uninfected and virus-infected plants	187
Literat	ture	202
	Principle of the part of the p	
Index		203