

I. Table of Contents

I.	Table of Contents	I
II.	List of Figures	IV
III.	List of Tables	V
IV.	List of Equation	VI
V.	List of Abbreviations	VII
1	General Introduction	12
1.1	Objectives	15
1.2	Structure of the dissertation	15
2	Suppressing <i>Alopecurus myosuroides</i> Huds. in Rotations of Winter-Annual and Spring Crops	18
2.1	Abstract	18
2.2	Introduction	20
2.3	Material and Methods	22
2.3.1	Field Experiment and Trial Design	22
2.3.2	Assessments of <i>A. myosuroides</i> Density and Control Efficacy	25
2.3.3	Statistical Analysis	26
2.4	Results	26
2.5	Discussion	31
2.5.1	Author Contributions:	34
2.5.2	Funding:	34
2.5.3	Acknowledgments:	34
2.5.4	Conflicts of Interest:	34
3	A long-term study of different crop rotations and herbicide strategies: Effects on <i>Alopecurus myosuroides</i> Huds. abundance and resistance development	36
3.1	Abstract	36
3.2	Introduction	38

3.3	Materials and methods	40
3.3.1	Field experiments	40
3.3.2	Observations and measurements	43
3.3.2.1	Blackgrass densities and yield	43
3.3.2.2	Herbicide resistance investigations	43
3.3.3	Statistical analysis	45
3.4	Results	45
3.4.1	Effect of crop rotations on blackgrass densities	45
3.4.2	Interaction of crop rotation and herbicide strategy	46
3.4.3	Effect of blackgrass infestation on crop yield	48
3.4.4	Herbicide resistance investigations	50
3.4.4.1	Greenhouse bioassay	50
3.4.4.2	Investigation of target-site-resistance (TSR)	52
3.5	Discussion	53
3.6	Conclusion	57
3.7	Acknowledgements	57
4	A long-term study of crop rotations, herbicide strategies and tillage practices: Effects on <i>Alopecurus myosuroides</i> Huds. abundance and contribution margins of the cropping systems	60
4.1	Abstract	60
4.2	Introduction	62
4.3	Materials and methods	63
4.3.1	Field experiments	63
4.3.2	Data collection	68
4.3.3	Data analysis	69
4.3.3.1	Calculation of contribution margins	69
4.3.3.2	Statistical analysis	69

4.4	Results	70
4.4.1	Field experiment	70
4.4.1.1	Effects on blackgrass infestation	70
4.4.1.2	Effects on crop yield	74
4.4.2	Analysis of costs	76
4.4.2.1	Variable costs of herbicides and machinery	76
4.4.2.2	Contribution margins (CM)	77
4.5	Discussion	79
4.6	Conclusion	83
4.7	Acknowledgements	83
5	General Discussion	86
5.1	Chemical control	88
5.2	Preventive measures	90
5.3	Mechanical measures	92
5.4	Analysis of costs	94
5.5	Recommendation	95
6	Summary	98
7	Zusammenfassung	100
8	References	104
	Danksagungen	114
	Curriculum vitae	116
	Eidesstattliche Erklärung	117