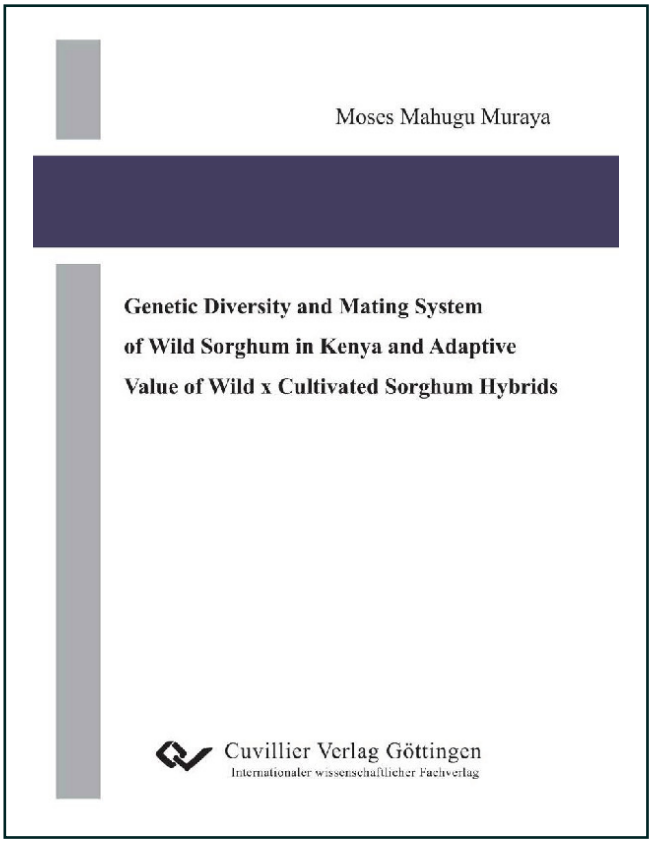
Moses Mahugu Muraya (Autor)

Genetic Diversity and Mating System of Wild Sorghum in Kenya and Adaptive Value of Wild x Cultivated Sorghum Hybrids



https://cuvillier.de/de/shop/publications/967

Copyright:
Cuvillier Verlag, Inhaberin Annette Jentzsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen, Germany
Telefon: +49 (0)551 54724-0, E-Mail: info@cuvillier.de, Website: https://cuvillier.de

Table of Content

List of Abbreviations vii
1 Introduction 1
1.1 Background Information 1
1.2 The Situation in Kenya 2
1.3 Objectives of the Study 2
2 Literature Review 3
2.1 Geographic Distribution of Wild Sorghum in Africa 3
2.2 Importance of Wild Sorghum 5
2.3 Sorghum Genetic Diversity and Molecular Markers 5
2.4 Hybridisation between Crops and their Wild Relatives 6
2.4.1 Adaptive Value of Wild-Crop Hybrids 6
2.4.2 Evaluation and Implications of Crop-to-Wild Hybridization in Sorghum 7
3 Materials and Methods 8
3.1 Geographical Distribution of Wild Sorghum in Kenya 8
3.2 Selection of Populations for Molecular and Phenotypic Diversity Studies 10
3.3 Analysis of Phenotypic Diversity 10
3.4 Molecular Genetic Studies 10
3.5 Estimation of the Outcrossing Rates 15
3.6 Pollen Competition between Wild and Cultivated Sorghum 16
3.7 Adaptive Value of Wild x Crop Cross Combinations in Generations F_1, F_2 and F_3 17
3.7.1 Mating Scheme 17
3.7.2 Evaluation of the Hybrids and their Parents 18
3.7.3 Data Analysis 19
4 Results and Discussion 20
4.1 Geographical Distribution of Wild Sorghum in Kenya 20
4.1.1 Results 20
4.1.2 Discussion 22
4.2 Phenotypic Diversity of Wild Sorghum 23
4.2.1 Results 23
4.2.2 Discussion 30
4.3 Molecular Genetic Diversity and Structure of Wild Sorghum 33
4.3.1 Results 33
4.3.2 Discussion 39
4.4 Estimation of Wild Sorghum Outcrossing Rates 42
4.4.1 Results 42
4.4.2 Discussion 46
4.5 Pollen Competition between Wild and Cultivated Sorghum 48
4.5.1 Results 48
4.5.2 Discussion 50
4.6 Adaptive Value of Wild x Crop Cross Combinations in Generations F_1, F_2 and F_3 52
4.6.1 Results 52
4.6.2 Discussion 58
5 General Discussion and Conclusions 62
5.1 General Discussion 62

5.2 Conclusions 63
5.3 Outlook 64
6 Summary 65
7 Zusammenfassung 68
9 Appendices 81
10 Acknowledgements 85
11 Curriculum vitae 86
12 Erklärung 87