

Contents

1	Introduction	1
	References	5
2	Setting the Background	7
	References	9
3	The Industry of Plant Breeding	11
3.1	The Significance of Plant Breeding in Society	11
3.1.1	Plant Breeding and Food Production	12
3.1.2	Plant Breeding and Biodiversity	14
3.1.3	Plant Breeding and Sustainability	16
3.1.4	Plant Breeding and Economic Growth	17
3.2	The Evolution of Plant Breeding: From the Farmer to the Industry	19
3.2.1	Industrial Plant Variety Production	21
3.2.2	Concentration in the Seed Market	23
3.2.3	Final Remarks	26
	References	26
4	Intellectual Property in Plant Breeding	31
4.1	Legal Aspects of Intellectual Property in Plant Breeding	32
4.1.1	Patent Rights	35
4.1.2	Breeder's Rights	56
4.1.3	Patents and Breeder's Rights: A Comparison	62
4.1.4	The Introduction of the Breeding Exception to Patent Rights	64
4.2	The Function of Intellectual Property in Plant Breeding	66
4.2.1	The Economic Function of Patent Protection	67
4.2.2	The Economic Function of Breeder's Rights	69
4.2.3	New Institutional Economics of Intellectual Protection in Plant Breeding	70

4.2.4	Economic Concerns on IPRs	73
4.2.5	Final Remarks	74
	References	75
5	Conceptualizing the Breeding Exception to Patent Rights:	
	A Legal and Economic Appraisal	79
5.1	Defining Exceptions to Patent Rights	80
5.1.1	The Rationale of Exceptions to Patent Rights	81
5.1.2	Research Exceptions to Patent Rights: An Overview of National Practices	86
5.1.3	Differentiating Research Exceptions to Patent Rights	93
5.1.4	Final Remarks	96
5.2	Conceptualizing the Breeding Exception	96
5.2.1	The Concept of the Breeding Exception	96
5.2.2	The Need for a Breeding Exception to Patent Rights: A Legal Assessment	97
5.2.3	The Need for a Breeding Exception to Patent Rights: An Economic Assessment	98
5.2.4	The Breeding Exception as a Response to a Potential Anticommons	99
5.2.5	Final Remarks	104
	References	105
6	The Breeding Exception to Patent Rights: Analysis of Compliance with Article 30 of the TRIPS Agreement	109
6.1	Principles of Interpretation	110
6.2	The Interpretation of Article 30 in the EC-Canada Case	111
6.3	A Limited Breeding Exception Under Article 30	112
6.3.1	First Condition: Limited Exception	113
6.3.2	Second Condition: Not Unreasonably Conflict with a Normal Exploitation of the Patent	115
6.3.3	Third Condition: Not Unreasonably Prejudice the Legitimate Interests of the Patent Owner, Taking Account of the Legitimate Interests of the Third Parties	119
6.3.4	The Non-discrimination Clause of Article 27.1	122
6.3.5	The Reasonableness Test	125
6.3.6	The Reasonableness Test and the Link to International Trade	132
6.4	A Comprehensive Breeding Exception Under Article 30 of the TRIPS Agreement	134
6.4.1	First Condition: Limited Exception	134
6.4.2	Second Condition: Not Unreasonably Conflict with a Normal Exploitation of the Patent	137

6.4.3	Third Condition: Not Unreasonably Prejudice the Legitimate Interests of the Patent Owner, Taking Account of the Legitimate Interests of the Third Parties . . .	138
6.4.4	The Reasonableness Test	141
6.5	Final Remarks	145
	References	146
7	Overview	151
7.1	A Limited Breeding Exception	152
7.2	A Comprehensive Breeding Exception	155
7.3	Implications of a Breeding Exception to Patent Rights	157
7.3.1	Theoretical Implications	157
7.3.2	Policy Implications	158
7.4	Limitations of the Study and Recommendation for Future Research	159
	References	159
	Annex: Interviewees (in Alphabetical Order)	161
	Bibliography	163