

EUROPE: BIOPESTICIDES MARKET

Prepared by:

CPL Business Consultants
Innovation Centre, Milton Park, Abingdon, Oxfordshire, OX14 4RY
Tel: +44 1865 257 057, info@cplconsult.com, www.cplconsult.com

Dr Ray Quinlan
Dr Steve Lisansky

© **CPL Scientific Limited**

All rights reserved. This publication is intended for the sole use of the purchaser. No reproduction, copy or transmission of this publication may be made without written permission of the publisher.

Published in the United Kingdom by

CPL Scientific Group Limited trading as CPL Business Consultants
info@cplconsult.com www.cplconsult.com

Written by R J Quinlan, edited by S G Lisansky

ISBN 978-0-9575492-2-7

While the information and concepts presented here are believed to be correct to the best of the knowledge of the authors, neither they nor CPL Scientific Limited accepts responsibility for any actions taken on the basis of this information, neither do they accept any liability for any omissions or errors of fact the report may contain.

TABLE OF CONTENTS

SUMMARY	1
THE EUROPEAN PESTICIDE MARKET	4
KEY CROPS	8
MARKET TRENDS	10
EU PESTICIDE REGULATIONS	11
THE REGULATIONS	11
APPROVED ACTIVE SUBSTANCES	14
EU SUSTAINABLE PESTICIDE USE	18
EU PESTICIDE USAGE DATA	19
EU REGULATORY AUTHORITIES	20
ORGANIC FARMING	22
EU LEGISLATION GOVERNING ORGANIC FARMING	24
PERMITTED BIOPESTICIDES	25
THE BIOPESTICIDE MARKET	26
MICROBIAL BIOPESTICIDES AVAILABLE FOR USE IN EUROPE	26
<i>Bacterial Products</i>	26
<i>Viral-Based Products</i>	34
<i>Fungal and Yeast-Based Products</i>	38
<i>Nematode-Based Products in Europe</i>	42
<i>The Market for Microbial Biopesticides</i>	44
<i>INVERTERBRATE BIOCONTROL AGENTS (IBCAs)</i>	47
<i>Invertebrate Biocontrol Agent Companies in Europe</i>	52
<i>The Market for IBCAs</i>	54
<i>SEMOCHEMICAL-BASED BIOPESTICIDES</i>	56
<i>Insect Pheromone Companies in Europe</i>	61
<i>The Market for Semiochemicals</i>	63
<i>Use of Semiochemicals in Monitoring Pest Populations</i>	65
<i>PLANT GROWTH REGULATOR BIOPESTICIDES</i>	66
<i>The Market for Plant Growth Regulators</i>	68
<i>BIOCHEMICAL-BASED BIOPESTICIDES</i>	68
<i>The Market for Biochemical Biopesticides</i>	74
TOTAL BIOPESTICIDE MARKET SIZE	75
DEVELOPMENTS IN THE BIOPESTICIDES BUSINESS IN EUROPE 2010-13	78
COUNTRY REPORTS	84
ALBANIA	84
<i>Key Pests</i>	84
<i>Biopesticides Marketed in Albania</i>	84
<i>Biopesticide Sales</i>	85
AUSTRIA	86
<i>Protected Horticulture</i>	87
<i>IPM</i>	87
<i>Fire Blight</i>	90
<i>Forestry</i>	90
<i>Technische Universitaet Graz</i>	91
<i>Organic</i>	91
<i>Biopesticides Marketed in Austria</i>	92
BELGIUM	101
<i>IPM</i>	102
<i>Organic</i>	103
<i>Biopesticides Marketed in Belgium</i>	103
BULGARIA	111

<i>IPM</i>	112
<i>Bt kurstaki/Forest Pests</i>	113
<i>Organic</i>	114
<i>Biopesticides Marketed in Bulgaria</i>	114
CROATIA	118
<i>IPM</i>	119
<i>Horticulture</i>	119
<i>Bt Use</i>	120
<i>Organic</i>	120
<i>Biopesticides Marketed in Croatia</i>	121
CYPRUS.....	125
<i>Key Pests</i>	126
<i>Organic</i>	127
<i>Biopesticides Marketed in Cyprus</i>	127
CZECH REPUBLIC	132
<i>Vines</i>	133
<i>Product 1</i>	134
<i>Mosquito Control</i>	134
<i>Organic</i>	135
<i>Biopesticides Marketed in the Czech Republic</i>	136
<i>Invertebrate Biocontrol Agents and Nematodes</i>	137
DENMARK.....	142
<i>IPM</i>	143
<i>Danish Centre for Biological Control</i>	144
<i>Organic</i>	144
<i>Biopesticides Marketed in Denmark</i>	145
<i>Biopesticide Sales</i>	150
ESTONIA.....	151
<i>Forestry</i>	152
<i>Organic</i>	152
<i>Biopesticides Marketed in Estonia</i>	153
FINLAND	156
<i>IPM</i>	157
<i>Company 1</i>	157
<i>Forestry</i>	158
<i>Biopesticides Marketed in Finland</i>	159
<i>Biopesticide Sales</i>	163
FRANCE.....	165
<i>IPM</i>	167
<i>Cereals</i>	168
<i>Maize/Corn</i>	168
<i>Orchards</i>	169
<i>Protected Cultivation</i>	170
<i>Product 2</i>	171
<i>Vines</i>	172
<i>Mosquito Control</i>	173
<i>Forestry</i>	176
<i>Organic</i>	177
<i>Biopesticides Marketed in France</i>	180
<i>Biopesticide Prices</i>	191
<i>Biopesticide Sales</i>	191
GERMANY	195
<i>IPM</i>	197
<i>Vines</i>	197
<i>Fruit</i>	198
<i>Product 3</i>	199
<i>Product 4</i>	201
<i>Company 2</i>	201
<i>Forestry</i>	202
<i>Public Health</i>	204

<i>Organic</i>	205
<i>Biopesticides Marketed in Germany</i>	206
<i>Biopesticide Prices</i>	214
<i>Biopesticide Sales</i>	215
GREECE.....	217
<i>Protected Cultivation</i>	219
<i>Vines</i>	220
<i>Mosquito Control</i>	221
<i>Organic</i>	223
<i>Biopesticides Marketed in Greece</i>	223
<i>Nematodes and Inveterbrate Biocontrol Agents</i>	225
HUNGARY	233
<i>IPM</i>	235
<i>Orchard Crops & Horticulture</i>	236
<i>Mosquitoes</i>	236
<i>Forestry</i>	237
<i>Organic</i>	237
<i>Biopesticides Marketed in Hungary</i>	238
<i>Biopesticide Prices</i>	243
IRELAND	244
<i>Organic</i>	245
<i>Biopesticides Marketed in Ireland</i>	245
ITALY	249
<i>IPM</i>	250
<i>Tomatoes</i>	251
<i>Grapevines</i>	252
<i>Protected Cultivation</i>	252
<i>Forestry</i>	253
<i>Mosquito Control</i>	254
<i>Organic</i>	255
<i>Biopesticides Marketed in Italy</i>	258
<i>Italian Biopesticide Companies</i>	270
<i>Biopesticide Sales</i>	273
LATVIA	276
<i>IPM</i>	277
<i>Company 3</i>	277
<i>Organic</i>	277
<i>Biopesticides Marketed in Latvia</i>	278
<i>Biopesticide Sales</i>	280
LITHUANIA.....	281
<i>Blackflies</i>	282
<i>Forestry</i>	282
<i>Organic</i>	282
<i>Biopesticides Marketed in Lithuania</i>	283
LUXEMBOURG.....	285
<i>Biopesticides Marketed in Luxembourg</i>	285
<i>Luxembourg Biopesticide Companies</i>	287
MALTA.....	288
<i>Biopesticides Marketed in Malta</i>	289
<i>Maltese Biopesticide Companies</i>	289
THE NETHERLANDS	291
<i>Horticulture and Protected Cropping</i>	292
<i>Bt</i>	293
<i>Company 4</i>	294
<i>Organics</i>	294
<i>Biopesticides Marketed in the Netherlands</i>	295
<i>Biopesticide Sales</i>	304
NORWAY	306
<i>Biopesticides Marketed in Norway</i>	307
<i>Biopesticide Market</i>	310

POLAND	311
<i>Horticulture</i>	313
<i>Polish Forestry</i>	313
<i>Forestry Stumps and Heterobasidion annosum</i>	315
<i>Organic</i>	315
<i>Biopesticides Marketed in Poland</i>	316
<i>Nematodes</i>	317
PORUGAL	322
<i>IPM</i>	323
<i>Protected Cultivation</i>	324
<i>Forestry</i>	325
<i>Organic</i>	325
<i>Biopesticides Marketed in Portugal</i>	326
<i>Biopesticide Prices</i>	330
<i>Biopesticide Sales</i>	331
ROMANIA	332
<i>Bt</i>	333
<i>Orchards</i>	333
<i>Vines</i>	334
<i>Forestry</i>	335
<i>Biopesticides Marketed in Romania</i>	335
SERBIA	339
<i>Company 5</i>	340
<i>Forestry</i>	340
<i>Organic</i>	340
<i>Biopesticides Marketed in Serbia</i>	341
SLOVAKIA	344
<i>Trichogramma</i>	345
<i>Vines</i>	345
<i>Organic</i>	346
<i>Biopesticides Marketed in Slovakia</i>	347
SLOVENIA	351
<i>IPM</i>	352
<i>Organic</i>	352
<i>Biopesticides Marketed in Slovenia</i>	353
SPAIN	357
<i>Protected Cultivation</i>	359
<i>New Viral Products</i>	364
<i>Fruit</i>	365
<i>GM and Sterile Insects</i>	367
<i>Mosquitoes</i>	368
<i>Forestry</i>	368
<i>Organic</i>	370
<i>Biopesticides Marketed in Spain</i>	371
<i>Biopesticide Sales</i>	394
SWEDEN	396
<i>IPM</i>	397
<i>Company 6</i>	397
<i>Organic</i>	398
<i>Biopesticides Marketed in Sweden</i>	399
<i>Nematodes</i>	400
<i>Biopesticide Sales</i>	403
SWITZERLAND	406
<i>IPM</i>	408
<i>May and June Bugs</i>	409
<i>Bt Use</i>	409
<i>Organic</i>	410
<i>Biopesticides Marketed in Switzerland</i>	411
<i>Biopesticide Prices</i>	418

TURKEY	422
<i>Bt Targets</i>	424
<i>Grapes</i>	425
<i>Protected Cultivation</i>	425
<i>Mosquitoes</i>	426
<i>Organic</i>	427
<i>Biopesticides Marketed in Turkey</i>	427
<i>Invertebrate Biocontrol Agents</i>	429
<i>Biopesticide Sales</i>	435
UNITED KINGDOM.....	440
<i>IPM</i>	441
<i>Product 5</i>	441
<i>Varroa Mite Control</i>	442
<i>Slugs in Potatoes, Cereals and Oilseed Rape</i>	442
<i>Products 6 and 7</i>	443
<i>Organic</i>	444
<i>Biopesticides Marketed in the UK</i>	445
<i>Nematodes and Invertebrate Biocontrol Agents</i>	447
<i>Biopesticide Prices</i>	456
<i>Biopesticide Sales</i>	456

TABLES

TABLE 1 ESTIMATED SALES OF BIOPESTICIDES IN EUROPE	1
TABLE 2 GROWTH RATES OF BIOPESTICIDES IN EUROPE	2
TABLE 3 MICROBIAL BIOPESTICIDES APPROVED IN EUROPE	14
TABLE 4 PHEROMONES APPROVED IN EUROPE	15
TABLE 5 BIOCHEMICAL BIOPESTICIDES APPROVED IN EUROPE	17
TABLE 6 EUROPEAN PESTICIDE REGISTRATION AUTHORITIES	20
TABLE 7 EUROPEAN ORGANIC FARMING AREA BY MEMBER STATE.....	23
TABLE 8 BACTERIAL BIOPESTICIDES AVAILABLE FOR USE IN EUROPE.....	26
TABLE 9 END-USER PRICES OF BACTERIAL BIOPESTICIDES IN EUROPE	31
TABLE 10 ESTIMATED EUROPEAN SALES OF BACTERIAL BIOPESTICIDES.....	34
TABLE 11 VIRAL BIOPESTICIDES AVAILABLE FOR USE IN EUROPE	35
TABLE 12 END-USER PRICES OF VIRAL INSECTICIDES IN EUROPE	36
TABLE 13 ESTIMATED EUROPEAN SALES OF VIRAL-BASED INSECTICIDES	38
TABLE 14 FUNGAL AND YEAST BIOPESTICIDES AVAILABLE FOR USE IN EUROPE.....	38
TABLE 15 END-USER PRICES OF FUNGAL PESTICIDES IN EUROPE	41
TABLE 16 ESTIMATED EUROPEAN SALES OF FUNGAL PESTICIDES	41
TABLE 17 NEMATODES COMMERCIALLY AVAILABLE IN EUROPE	42
TABLE 18 END-USER PRICES OF BENEFICIAL NEMATODES IN EUROPE	43
TABLE 19 ESTIMATED EUROPEAN SALES OF MICROBIAL & NEMATODE-BASED BIOPESTICIDES	45
TABLE 20 IBCAs AVAILABLE FOR USE IN EUROPE.....	47
TABLE 21 BIGGEST SELLING IBCAs IN EUROPE	51
TABLE 22 IBCA COMPANIES IN EUROPE.....	52
TABLE 23 END-USER PRICES OF IBCAs IN EUROPE	54
TABLE 24 BIOPESTICIDAL PHEROMONES AVAILABLE FOR USE IN EUROPE	57
TABLE 25 PRINCIPAL INSECT PHEROMONE COMPANIES IN EUROPE	61
TABLE 26 END-USER PRICES OF PHEROMONES IN EUROPE	62
TABLE 27 PGR BIOPESTICIDES COMMERCIALLY AVAILABLE IN EUROPE	67
TABLE 28 BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN EUROPE.....	69
TABLE 29 END USER PRICES OF BIOCHEMICAL BIOPESTICIDES IN EUROPE.....	73
TABLE 30 ESTIMATED EUROPEAN SALES OF BIOPESTICIDES.....	75
TABLE 31 GROWTH RATES OF BIOPESTICIDES IN EUROPE.....	76
TABLE 32 BIOPESTICIDES APPROVED FOR USE IN ALBANIA.....	85
TABLE 33 BIOPESTICIDES APPROVED FOR USE IN IPM PROGRAMMES IN GRAPEVINES	88
TABLE 34 BIOPESTICIDES APPROVED FOR USE IN IPM PROGRAMMES IN FRUIT	88
TABLE 35 BIOPESTICIDES APPROVED FOR USE IN IPM PROGRAMMES IN VEGETABLES	89
TABLE 36 APPROVED <i>Bt KURSTAKI</i> FORESTRY USE IN AUSTRIA.....	90

TABLE 37	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN AUSTRIA.....	92
TABLE 38	NEMATODES COMMERCIALLY AVAILABLE IN AUSTRIA.....	94
TABLE 39	IBCAs APPROVED FOR USE IN AUSTRIA.....	95
TABLE 40	pheromones APPROVED FOR USE IN AUSTRIA	96
TABLE 41	pheromones FOR TRAPS AND LURES SOLD BY COMPANY 7	96
TABLE 42	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN AUSTRIA	98
TABLE 43	COMPANIES SELLING BIOPESTICIDES IN AUSTRIA.....	99
TABLE 44	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN BELGIUM	104
TABLE 45	NEMATODES COMMERCIALLY AVAILABLE IN BELGIUM	104
TABLE 46	END-USER PRICES OF MICROBIAL BIOPESTICIDES IN BELGIUM	105
TABLE 47	IBCAs AVAILABLE FOR USE IN BELGIUM.....	105
TABLE 48	pheromones APPROVED FOR USE IN BELGIUM	107
TABLE 49	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN BELGIUM.....	108
TABLE 50	COMPANIES SELLING IBCAs IN BELGIUM	109
TABLE 51	MICROBIAL BIOPESTICIDES AVAILABLE FOR USE IN BULGARIA	115
TABLE 52	IBCAs AVAILABLE FOR USE IN BULGARIA.....	115
TABLE 53	pheromones APPROVED FOR USE IN BULGARIA	116
TABLE 54	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN BULGARIA.....	117
TABLE 55	COMPANIES SELLING BIOPESTICIDES IN BULGARIA	117
TABLE 56	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN CROATIA.....	121
TABLE 57	IBCAs AVAILABLE FOR USE IN CROATIA.....	122
TABLE 58	BIOCHEMICAL BIOPESTICIDES AVAILABLE IN CROATIA	123
TABLE 59	COMPANIES SELLING BIOPESTICIDES IN CROATIA	123
TABLE 60	KEY CROP PEST AND DISEASE PROBLEMS IN CYPRUS	126
TABLE 61	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN CYPRUS	128
TABLE 62	NEMATODES APPROVED FOR USE IN CYPRUS	129
TABLE 63	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN CYPRUS.....	129
TABLE 64	COMPANIES SELLING MICROBIAL AND IBCA BIOPESTICIDES IN CYPRUS.....	130
TABLE 65	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN THE CZECH REPUBLIC.....	136
TABLE 66	NEMATODES COMMERCIALLY AVAILABLE IN THE CZECH REPUBLIC	137
TABLE 67	IBCAs AVAILABLE FOR USE IN CZECH REPUBLIC	138
TABLE 68	pheromones APPROVED FOR USE IN CZECH REPUBLIC.....	138
TABLE 69	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN CZECH REPUBLIC	139
TABLE 70	PROPHR PHEROMONE PRODUCTS	140
TABLE 71	BIOPESTICIDE COMPANIES IN THE CZECH REPUBLIC.....	140
TABLE 72	MICROBIAL BIOPESTICIDES AVAILABLE FOR USE IN DENMARK	145
TABLE 73	NEMATODES COMMERCIALLY AVAILABLE IN DENMARK	146
TABLE 74	IBCAs AVAILABLE FOR USE IN DENMARK	146
TABLE 75	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN DENMARK	147
TABLE 76	BIOPESTICIDE COMPANIES IN DENMARK	149
TABLE 77	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN ESTONIA	153
TABLE 78	IBCAs AND NEMATODES AVAILABLE FOR USE IN ESTONIA	154
TABLE 79	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN ESTONIA.....	154
TABLE 80	BIOPESTICIDE COMPANIES IN ESTONIA	155
TABLE 81	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN FINLAND	159
TABLE 82	NEMATODES COMMERCIALLY AVAILABLE IN FINLAND.....	160
TABLE 83	IBCAs AVAILABLE FOR USE IN FINLAND	160
TABLE 84	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN FINLAND	161
TABLE 85	BIOPESTICIDE COMPANIES IN FINLAND	162
TABLE 86	PROTECTED CULTIVATION IN FRANCE	170
TABLE 87	pheromones APPROVED FOR USE IN FRENCH VINEYARDS.....	172
TABLE 88	Bt PRODUCTS FOR USE AGAINST CATERPILLARS ON VINES IN FRANCE	173
TABLE 89	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN FRANCE	180
TABLE 90	NEMATODES COMMERCIALLY AVAILABLE IN FRANCE	181
TABLE 91	IBCAs AVAILABLE FOR USE IN FRANCE	182
TABLE 92	pheromones APPROVED FOR USE IN FRANCE	184
TABLE 93	BIO-PLANT GROWTH REGULATORS APPROVED FOR USE IN FRANCE.....	185
TABLE 94	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN FRANCE	186
TABLE 95	BIOPESTICIDE COMPANIES IN FRANCE	188
TABLE 96	END-USER PRICES OF BIOPESTICIDES IN FRANCE	191

TABLE 97	POTENTIAL MARKET FOR BIOCONTROL AGENTS IN FRANCE	194
TABLE 98	KEY PESTS OF GRAPEVINE IN GERMANY	198
TABLE 99	BIPLANTOL HOMEOPATHIC PRODUCTS	200
TABLE 100	INSECTICIDES APPROVED FOR USE IN GERMAN FORESTRY	203
TABLE 101	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN GERMANY	206
TABLE 102	NEMATODES COMMERCIALLY AVAILABLE IN GERMANY	208
TABLE 103	IBCAS AVAILABLE FOR USE IN GERMANY	209
TABLE 104	BIOCHEMICAL BIOPESTICIDES/pheromones/PGRs APPROVED FOR USE IN GERMANY	211
TABLE 105	BIOPESTICIDE COMPANIES IN GERMANY	212
TABLE 106	END-USER PRICES OF MICROBIAL BIOPESTICIDES IN GERMANY	214
TABLE 107	<i>Bt</i> USE IN GERMAN AGRICULTURE AND HORTICULTURE	216
TABLE 108	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN GREECE	224
TABLE 109	NEMATODES COMMERCIALLY AVAILABLE IN GREECE	225
TABLE 110	IBCAS AVAILABLE FOR USE IN GREECE	225
TABLE 111	pheromones APPROVED FOR USE IN GREECE	227
TABLE 112	pheromone PRODUCTS AVAILABLE FROM ANTHESIS	227
TABLE 113	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN GREECE	228
TABLE 114	COMPANIES SELLING BIOCHEMICAL/PGR/pheromone BIOPESTICIDES IN GREECE	230
TABLE 115	MICROBIAL BIOPESTICIDES REGISTERED FOR USE IN HUNGARY	238
TABLE 116	NEMATODES COMMERCIALLY AVAILABLE IN HUNGARY	239
TABLE 117	IBCAS AVAILABLE FOR USE IN HUNGARY	240
TABLE 118	BIOCHEMICAL BIOPESTICIDES REGISTERED FOR USE IN HUNGARY	240
TABLE 119	COMPANIES SELLING BIOCHEMICAL BIOPESTICIDES IN HUNGARY	242
TABLE 120	END-USER PRICES OF BIOPESTICIDES IN HUNGARY	243
TABLE 121	MICROBIAL BIOPESTICIDES REGISTERED FOR USE IN IRELAND	245
TABLE 122	NEMATODES COMMERCIALLY AVAILABLE IN IRELAND	245
TABLE 123	BIOCHEMICAL BIOPESTICIDES/pheromones/PGRs REGISTERED FOR USE IN IRELAND	246
TABLE 124	COMPANIES SELLING BIOCHEMICAL BIOPESTICIDES IN IRELAND	247
TABLE 126	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN ITALY	258
TABLE 127	NEMATODES COMMERCIALLY AVAILABLE IN ITALY	261
TABLE 128	LABELLED APPLICATIONS FOR ENTOMOPATHOGENIC NEMATODES IN ITALY	261
TABLE 129	IBCAS AVAILABLE FOR USE IN ITALY	262
TABLE 130	THE PRICES OF IBCAs IN ITALY	264
TABLE 131	BIO-PLANT GROWTH REGULATORS APPROVED FOR USE IN ITALY	264
TABLE 132	USES FOR GIBBERELlic ACID IN ITALY	265
TABLE 133	USES FOR GIBBERELlic ACID + NAA IN ITALY	266
TABLE 134	pheromone BIOPESTICIDES AVAILABLE IN ITALY	267
TABLE 135	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN ITALY	269
TABLE 136	COMPANIES SELLING BIOPESTICIDES IN ITALY	270
TABLE 137	MATING DISRUPTION pheromone USE IN ITALY	274
TABLE 138	MICROBIAL BIOPESTICIDES REGISTERED FOR USE IN LATVIA	278
TABLE 139	IBCAS AVAILABLE FOR USE IN LATVIA	279
TABLE 140	BIOCHEMICAL BIOPESTICIDES REGISTERED FOR USE IN LATVIA	280
TABLE 141	COMPANIES SELLING BIOPESTICIDES IN LATVIA	280
TABLE 142	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN LITHUANIA	283
TABLE 143	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN LITHUANIA	283
TABLE 144	COMPANIES SELLING BIOPESTICIDES IN LITHUANIA	284
TABLE 145	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN LUXEMBOURG	286
TABLE 146	OTHER BIOPESTICIDES APPROVED FOR USE IN LUXEMBOURG	286
TABLE 147	COMPANIES SELLING BIOPESTICIDES IN LUXEMBOURG	287
TABLE 148	BIOPESTICIDES REGISTERED FOR USE IN MALTA	289
TABLE 149	COMPANIES SELLING BIOPESTICIDES IN MALTA	289
TABLE 150	KEY TARGETS FOR <i>Bt</i> PRODUCTS IN THE NETHERLANDS	293
TABLE 151	MICROBIAL BIOPESTICIDES REGISTERED FOR USE IN THE NETHERLANDS	295
TABLE 152	NEMATODES COMMERCIALLY AVAILABLE IN THE NETHERLANDS	296
TABLE 153	IBCAS AVAILABLE FOR USE IN THE NETHERLANDS	296
TABLE 154	pheromone PRODUCTS REGISTERED FOR USE IN THE NETHERLANDS	299
TABLE 155	PGR BIOPESTICIDES COMMERCIALlY AVAILABLE IN THE NETHERLANDS	299
TABLE 156	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN NETHERLANDS	300
TABLE 157	COMPANIES SELLING MICROBIAL BIOPESTICIDES IN THE NETHERLANDS	302

TABLE 158	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN NORWAY	308
TABLE 159	NEMATODES COMMERCIALLY AVAILABLE IN NORWAY	308
TABLE 160	IBCAs AVAILABLE FOR USE IN NORWAY	308
TABLE 161	OTHER BIOPESTICIDES APPROVED FOR USE IN NORWAY	309
TABLE 162	COMPANIES SELLING BIOPESTICIDES IN NORWAY	309
TABLE 163	BIOPESTICIDE USE IN NORWAY.....	310
TABLE 164	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN POLAND	316
TABLE 165	NEMATODES COMMERCIALLY AVAILABLE IN POLAND.....	317
TABLE 166	IBCAs AVAILABLE FOR USE IN POLAND	318
TABLE 167	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN POLAND.....	319
TABLE 168	COMPANIES SELLING BIOPESTICIDES IN POLAND.....	320
TABLE 169	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN PORTUGAL.....	326
TABLE 170	NEMATODES COMMERCIALLY AVAILABLE IN PORTUGAL.....	327
TABLE 171	OTHER BIOPESTICIDES APPROVED FOR USE IN PORTUGAL	328
TABLE 172	PHEROMONES FOR PEST MONITORING AVAILABLE IN PORTUGAL	329
TABLE 173	COMPANIES SELLING BIOPESTICIDES IN PORTUGAL	330
TABLE 174	END-USER PRICES OF BIOPESTICIDES FROM BIOSANI, PORTUGAL	331
TABLE 175	MAIN APPLICATIONS OF <i>Bt</i> PRODUCTS IN ROMANIA	333
TABLE 176	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN ROMANIA.....	336
TABLE 177	IBCAs AVAILABLE FOR USE IN ROMANIA	336
TABLE 178	OTHER BIOPESTICIDES APPROVED FOR USE IN ROMANIA	337
TABLE 179	COMPANIES SELLING BIOPESTICIDES IN ROMANIA	337
TABLE 180	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN SERBIA	342
TABLE 181	IBCAs AVAILABLE FOR USE IN SERBIA	342
TABLE 182	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN SERBIA	343
TABLE 183	COMPANIES SELLING BIOPESTICIDES IN SERBIA	343
TABLE 184	USE OF <i>TRICHOGRAMMA</i> WASPS IN SLOVAKIA	345
TABLE 185	ORGANIC PROGRAMME FOR VINES IN SLOVAKIA.....	345
TABLE 186	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN SLOVAKIA.....	347
TABLE 187	NEMATODES COMMERCIALLY AVAILABLE IN SLOVAKIA	348
TABLE 188	IBCAs AVAILABLE FOR USE IN SLOVAKIA	348
TABLE 189	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN THE SLOVAKIA.....	349
TABLE 190	PHEROMONE TRAPS AVAILABLE IN SLOVAKIA FROM BIO TOMAL.....	349
TABLE 191	COMPANIES SELLING BIOPESTICIDES IN SLOVAKIA	350
TABLE 192	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN SLOVENIA	353
TABLE 193	NEMATODES COMMERCIALLY AVAILABLE IN SLOVENIA.....	353
TABLE 194	IBCAs AVAILABLE FOR USE IN SLOVENIA	354
TABLE 195	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN SLOVENIA	355
TABLE 196	COMPANIES SELLING BIOPESTICIDES IN SLOVENIA.....	356
TABLE 198	APPROVED APPLICATIONS FOR <i>Bt KURSTAKI</i> IN SPAIN	364
TABLE 199	AREA OF MATING DISRUPTION IN EXTREMADURA BY DIFFUSER TYPE	366
TABLE 200	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN SPAIN.....	371
TABLE 201	NEMATODE PRODUCTS AVAILABLE IN SPAIN	375
TABLE 202	IBCAs APPROVED FOR USE IN SPAIN	377
TABLE 203	IBCA HOST SUPPLEMENTS AVAILABLE FOR USE IN SPAIN.....	383
TABLE 204	BIOCHEMICAL PLANT GROWTH REGULATORS APPROVED FOR USE IN SPAIN	383
TABLE 205	PHEROMONE BIOPESTICIDES AVAILABLE IN SPAIN	384
TABLE 206	SEDQ PHEROMONE COMPONENT RANGE	385
TABLE 207	SEDQ PHEROMONE PRODUCTS (MIXTURES)	386
TABLE 208	SEDQ FINAL PRODUCT “FORMULATES”.....	387
TABLE 209	EPA-ECOLOGIA PHEROMONE PRODUCTS	388
TABLE 210	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN SPAIN	389
TABLE 211	COMPANIES SELLING BIOPESTICIDES IN SPAIN	391
TABLE 212	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN SWEDEN.....	399
TABLE 213	NEMATODES COMMERCIALLY AVAILABLE IN SWEDEN	400
TABLE 214	IBCAs AVAILABLE FOR USE IN SWEDEN	401
TABLE 215	BIOCHEMICAL BIOPESTICIDES/PGRs/PHEROMONES APPROVED FOR USE IN SWEDEN	401
TABLE 216	COMPANIES SELLING NEMATODES IN SWEDEN.....	402
TABLE 217	SALES OF BIOPESTICIDES IN SWEDEN	403
TABLE 218	SALES OF IBCAs IN SWEDEN	404

TABLE 219	MICROBIAL BIOPESTICIDES REGISTERED FOR USE IN SWITZERLAND.....	411
TABLE 220	MICROBIAL “BIOFERTILIZERS” AVAILABLE IN SWITZERLAND	413
TABLE 221	NEMATODES COMMERCIALLY AVAILABLE IN SWITZERLAND.....	414
TABLE 222	IBCAS AVAILABLE FOR USE IN SWITZERLAND.....	415
TABLE 223	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN SWITZERLAND.....	416
TABLE 224	END-USER PRICES OF BIOPESTICIDES IN SWITZERLAND	418
TABLE 225	END-USER PRICES OF IBCAS IN SWITZERLAND.....	419
TABLE 226	COMPANIES SELLING NEMATODES IN SWITZERLAND	420
TABLE 227	MAJOR TARGETS FOR BT PRODUCTS IN TURKEY	424
TABLE 228	PROTECTED CULTIVATION IN TURKEY.....	426
TABLE 229	MICROBIAL BIOPESTICIDES APPROVED FOR USE IN TURKEY	427
TABLE 230	IBCAS AVAILABLE FOR USE IN TURKEY	429
TABLE 231	pheromones APPROVED FOR USE IN TURKEY	430
TABLE 232	BIOCHEMICAL BIOPESTICIDES APPROVED FOR USE IN TURKEY.....	432
TABLE 233	COMPANIES SELLING BIOPESTICIDES IN TURKEY	433
TABLE 234	SALES OF BIOCHEMICAL BIOPESTICIDES IN TURKEY.....	439
TABLE 235	PRODUCT 8 OFF-LABEL APPROVALS IN THE UK.....	442
TABLE 236	BIOPESTICIDES APPROVED FOR USE IN UK ORGANIC AGRICULTURE	444
TABLE 237	MICROBIAL BIOPESTICIDES REGISTERED FOR USE IN THE UK.....	446
TABLE 238	NEMATODES COMMERCIALLY AVAILABLE IN THE UK	447
TABLE 239	IBCAS AVAILABLE FOR USE IN THE UK.....	447
TABLE 240	BIOCHEMICAL BIOPESTICIDES/PGRs APPROVED FOR USE IN THE UK.....	449
TABLE 241	APPLICATIONS FOR GIBBERELLINS A4+A7 IN THE UK	452
TABLE 242	EXOSECT PHEROMONE PRODUCTS	453
TABLE 243	COMPANIES SELLING BIOPESTICIDES IN THE UK	454
TABLE 244	END-USER PRICES OF MICROBIAL BIOPESTICIDES IN THE UK	456

FIGURES

FIGURE 1 EUROPEAN BIOPESTICIDE MARKET BY TYPE.....	2
FIGURE 2 EUROPEAN PESTICIDE MARKET BY TYPE	5
FIGURE 3 EUROPEAN PESTICIDE MARKET	5
FIGURE 4 AGROCHEMICAL USE IN EUROPE BY VALUE	6
FIGURE 5 USE OF AGRICULTURAL PESTICIDES IN EUROPE (BY VALUE).....	7
FIGURE 6 FUNGICIDE USE IN EUROPE BY CROP (BY WEIGHT)	8
FIGURE 7 INSECTICIDE USE IN EUROPE BY CROP (BY WEIGHT)	9
FIGURE 8 AGRICHEMICAL USE IN EUROPE BY CROP (BY VALUE).....	10
FIGURE 9 AREA OF ORGANIC FARMING IN EUROPE	22
FIGURE 10 THE EU ORGANIC LOGO	25
FIGURE 11 ESTIMATED SALES OF MICROBIAL & NEMATODE-BASED BIOPESTICIDES BY PRODUCT TYPE	46
FIGURE 12 ESTIMATED EUROPEAN SALES OF MICROBIAL BIOPESTICIDES	46
FIGURE 13 ESTIMATED EUROPEAN SALES OF IBCAS	55
FIGURE 14 EUROPEAN BIOPESTICIDE MARKET	76
FIGURE 15 MAJOR ARABLE CROPS GROWN IN AUSTRIA (BY AREA)	86
FIGURE 16 MAJOR ARABLE CROPS GROWN IN BELGIUM (BY AREA).....	101
FIGURE 17 VALUE OF PESTICIDES IN BELGIUM	102
FIGURE 18 MAJOR ARABLE CROPS GROWN IN BULGARIA (BY AREA).....	111
FIGURE 19 VALUE OF PESTICIDES IN BELGIUM	112
FIGURE 20 MAJOR ARABLE CROPS GROWN IN CROATIA (BY AREA)	118
FIGURE 21 AREA OF ORGANIC FARMING IN CROATIA	121
FIGURE 22 MAJOR ARABLE CROPS GROWN IN CYPRUS (BY AREA).....	125
FIGURE 23 VALUE OF PESTICIDES IN CROATIA.....	126
FIGURE 24 MAJOR ARABLE CROPS GROWN IN CZECH REPUBLIC (BY AREA)	133
FIGURE 25 AREA OF ORGANIC ORCHARD IN THE CZECH REPUBLIC	135
FIGURE 26 MAJOR ARABLE CROPS GROWN IN DENMARK (BY AREA)	142
FIGURE 27 MAJOR ARABLE CROPS GROWN IN ESTONIA (BY AREA)	151
FIGURE 28 MAJOR ARABLE CROPS GROWN IN FINLAND (BY AREA)	156
FIGURE 29 BIOPESTICIDE USE IN FINLAND (TONNES APPLIED).....	163
FIGURE 30 MAJOR ARABLE CROPS GROWN IN FRANCE (BY AREA).....	165
FIGURE 31 PESTICIDES USED IN FRANCE (BY VALUE)	166

FIGURE 32 EXPENDITURE ON <i>BT ISRAELENSIS</i> IN THE RHÔNE-ALPES	174
FIGURE 33 AREA TREATED WITH <i>BT ISRAELENSIS</i> IN THE FRENCH MEDITERRANEAN COAST AREA	175
FIGURE 34 ORGANIC CROPPING IN FRANCE	178
FIGURE 35 ORGANIC CROPPING AREAS BY CROP TYPE IN FRANCE	179
FIGURE 36 USE OF PHEROMONE MATING DISRUPTION IN ORCHARDS AND VINEYARDS IN FRANCE	193
FIGURE 37 MAJOR ARABLE CROPS GROWN IN GERMANY (BY AREA).....	195
FIGURE 38 PESTICIDES USED IN GERMANY (BY VALUE).....	196
FIGURE 39 AREA OF ORGANIC FARMING IN GERMANY	205
FIGURE 40 MAJOR ARABLE CROPS GROWN IN GREECE (BY AREA)	217
FIGURE 41 PESTICIDES USED IN GREECE (BY VALUE).....	218
FIGURE 42 CROPS GROWN IN PROTECTED CULTIVATION IN GREECE (BY AREA)	219
FIGURE 43 MAJOR ARABLE CROPS GROWN IN HUNGARY (BY AREA)	233
FIGURE 44 PESTICIDES USED IN HUNGARY (BY VALUE).....	234
FIGURE 45 PESTICIDE MARKET IN HUNGARY (BY VALUE)	235
FIGURE 46 MAJOR ARABLE CROPS GROWN IN IRELAND (BY AREA)	244
FIGURE 47 MAJOR ARABLE CROPS GROWN IN ITALY (BY AREA)	249
FIGURE 48 PESTICIDES USED IN ITALY (BY VALUE).....	250
FIGURE 49 AREA OF ORGANIC FARMING IN ITALY	256
FIGURE 50 ORGANIC FRUIT GROWN IN ITALY (BY AREA)	257
FIGURE 51 MAJOR ARABLE CROPS GROWN IN LATVIA (BY AREA)	276
FIGURE 52 MAJOR ARABLE CROPS GROWN IN LITHUANIA (BY AREA)	281
FIGURE 53 MAJOR ARABLE CROPS GROWN IN LUXEMBOURG (BY AREA)	285
FIGURE 54 MAJOR ARABLE CROPS GROWN IN MALTA (BY AREA)	288
FIGURE 55 MAJOR ARABLE CROPS GROWN IN THE NETHERLANDS (BY AREA)	291
FIGURE 56 MAJOR ARABLE CROPS GROWN IN NORWAY (BY AREA)	306
FIGURE 57 MAJOR ARABLE CROPS GROWN IN POLAND (BY AREA)	312
FIGURE 58 PESTICIDES USED IN POLAND (BY VALUE)	312
FIGURE 59 MAJOR ARABLE CROPS GROWN IN PORTUGAL (BY AREA)	322
FIGURE 60 PESTICIDES USED IN PORTUGAL (BY VALUE)	323
FIGURE 61 MAJOR ARABLE CROPS GROWN IN ROMANIA (BY AREA)	332
FIGURE 62 MAJOR ARABLE CROPS GROWN IN SERBIA (BY AREA)	339
FIGURE 63 CERTIFIED ORGANIC CROPPING IN SERBIA (BY CROP)	341
FIGURE 64 MAJOR ARABLE CROPS GROWN IN SLOVAKIA (BY AREA)	344
FIGURE 65 MAJOR ARABLE CROPS GROWN IN SLOVENIA (BY AREA)	351
FIGURE 66 MAJOR ARABLE CROPS GROWN IN SPAIN (BY AREA)	357
FIGURE 67 MAJOR ARABLE CROPS GROWN IN SPAIN (BY VALUE)	358
FIGURE 68 PESTICIDES SALES IN SPAIN (BY VALUE)	359
FIGURE 69 GROWTH IN THE USE OF BIOLOGICAL CONTROL ON SWEET PEPPERS IN ALMERIA.....	362
FIGURE 70 GROWTH IN THE USE OF IPM IN PROTECTED CROPPING IN ALMERIA	362
FIGURE 71 CODLING MOTH MATING DISRUPTION IN LÉRIDA (AREA TREATED)	365
FIGURE 72 PEACH TWIG BORER AND CODLING MOTH MATING DISRUPTION IN EXTREMADURA	366
FIGURE 73 CROPS GROWN ORGANICALLY IN SPAIN (BY AREA).....	370
FIGURE 74 MAJOR CROPS GROWN IN SWEDEN (BY AREA)	396
FIGURE 75 MAJOR ARABLE CROPS GROWN IN SWITZERLAND (BY AREA)	407
FIGURE 76 PESTICIDE USE IN SWITZERLAND	407
FIGURE 77 MAJOR ARABLE CROPS GROWN IN TURKEY (BY AREA)	422
FIGURE 78 PESTICIDES USED IN TURKEY (BY VALUE)	423
FIGURE 79 MICROBIAL BIOPESTICIDES USED IN TURKEY (BY VALUE)	436
FIGURE 80 <i>Bt</i> SALES IN TURKEY (BY WEIGHT).....	437
FIGURE 81 IBCAS USED IN TURKEY (BY VALUE)	438
FIGURE 82 BIOPESTICIDE MARKET IN TURKEY (BY VALUE)	439
FIGURE 83 MAJOR ARABLE CROPS GROWN IN THE UK (BY AREA)	440
FIGURE 84 <i>Bt</i> USE IN THE UK (HECTARES TREATED)	457
FIGURE 85 <i>LECANICILLIUM MUSCARIUM (VERTICILLIUM LECANI</i>) USE IN THE UK	458
FIGURE 86 <i>BACILLUS SUBTILIS</i> USE IN THE UK (HECTARES TREATED)	459
FIGURE 87 FERRIC PHOSPHATE USE IN THE UK (HECTARES TREATED)	460
FIGURE 88 FATTY ACID BIOPESTICIDE USE IN THE UK (HECTARES TREATED).....	460
FIGURE 88 GIBBERELLIC ACID/GIBBERELLINS USE IN THE UK (HECTARES TREATED).....	461