APPENDIX 7: POST MARKET MONITORING OF *BT* MAIZE MON 810 IN EUROPE: SURVEY WITH FARM QUESTIONNAIRES IN 2009

BioMath

APPLIED STATISTICS AND INFORMATICS
IN LIFE SCIENCES

Post Market Monitoring of insect protected *Bt*-maize MON 810[1] in Europe

Biometrical anual Report 2009

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[1] The commercial name for MON 810 being YieldGard® maize. YieldGard® is a registered trademark of Monsanto Technology LLC.

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Summary

Monitoring of a genetically modified organism (GMO) that has been placed on the market is regulated in Annex VII of Directive 2001/18/EC [14]. Monitoring should identify any adverse effect of the GMO and its use on human health or the environment. Monsanto has implemented monitoring of Bt-maize containing event MON 810 through different tools, the main one being a farm questionnaire since 2006.

This biometrical report presents the outcomes of the statistical analysis of the farm questionnaires collected throughout European MON 810 cultivating countries in 2009. The questionnaires have been completed between November 2009 and January 2010. In the 2009 growing season 240 farm questionnaires have been surveyed.

2009 data indicates that in comparison to conventional maize plants, MON 810 plants

- received less insecticides caused by their inherent protection against certain lepidopteran pests,
- were harvested later caused by increased flexibility (cropping system, logistics, channeling and coexistence) and the status of the plant (development, health, maturity, water content),
- germinated more vigorously caused by the high quality germplasm,
- grew and developed slightly faster caused by better fitness of the plant and the high quality germplasm,
- had less incidence of stalk/root lodging caused by the inherent protection against certain lepidopteran pests,
- had a longer time to maturity caused by the absence of pest pressure of certain lepidopteran pests,
- gave a higher yield caused by the better fitness of the plant,
- were observed less as volunteers from previous year's planting caused by a more effective previous year's harvest,
- were less susceptible to diseases caused by hardly any insect feeding damage,
- controlled corn borers very well caused by the inherent protection against certain lepidopteran pests, and
- were less susceptible to pests, other than corn borers, especially lepidopteran pests caused by the inherent protection against certain lepidopteran pests and the resulting better fitness of the plants.

Moreover the animals fed with MON 810 performed slightly different compared to those fed with conventional maize. MON 810 fed animals were healthier resulting from a lower incidence of mycotoxins in the feed (due to lower ECB feeding damage on the plant).

The identified deviations have been expected, due to the knowledge of the MON 810 characteristics. The observed significant effects are not adverse. They mostly relate to the increased fitness of MON 810 plants resulting from the inherent protection against certain lepidopteran pests. Overall, the monitoring results substantiate the results from scientific research.

In this year of data collection no adverse effects have been identified by MON 810 cultivating farmers.

Chapter 1

Introduction

According to Annex VII of Directive 2001/18/EC [14] of the European Parliament and of the Council on the deliberate release into the environment of genetically modified plants, the objective of the monitoring is to:

- confirm that any assumption regarding the occurrence and impact of potential adverse effects of the GMO or its use in the environmental risk assessment are correct, and
- identify the occurrence of adverse effects of the GMO or its use on human health or the environment, which were not anticipated in the environmental risk assessment.

Upon approval of MON 810 (Commission Decision 98/294/EC [13]), Monsanto has established a management strategy in order to minimize the development of insect resistance and offered to inform the Commission and/or the Competent Authorities of the results.

The risk assessment for MON 810 shows that the placing on the market of MON 810 poses negligible risk to the environment. Any potential adverse effects of MON 810 on human health and the environment, which were not anticipated in the risk assessment, can be addressed under General Surveillance (GS). An essential element of the GS applied by Monsanto is a farm questionnaire.

The objective of this biometrical report is to present the rationale behind the questionnaire approach and the analysis of the farm questionnaires used with farmers during the 2009 planting season. The questionnaire approach was applied for the first time in 2005. The format of the questionnaire is reviewed on a yearly basis based on the outcome of the latest survey.

Chapter 2

Methodology

2.1 Tool for general surveillance: the farm questionnaire

Structure of the farm questionnaire

Based on commonly defined protection goals, such as soil function, plant health, sustainable agriculture, etc. and derived areas of potential impact on these protection goals, a range of relevant monitoring characters for MON 810 GS have been identified. These monitoring characters (see Table 2.1 and 2.2) might be influenced by the cultivation of MON 810, but in an agricultural landscape other influencing factors (see Table 2.3) exist which need to be taken into account as well, and therefore were also monitored.

For that purpose a farm questionnaire was designed to obtain data on monitoring characters and influencing factors. Any unusual observations observed in monitoring characters would lead to a consideration of the information gathered to determine whether the effect is attributable to changes in influencing factors or the genetic modification (see Attachment 1). Farmers record a range of agronomic information, and are the most frequent and consistent observers of crops and fields. For example, they collect field-specific records of seeds, tilling methods, physical and chemical soil analysis, fertilizer application, crop protection measures, yields and quality. Additionally, farmers hold in their "farm files" historical records of their agricultural land and its management. These provide background knowledge and experience that can be used as a baseline for assessing deviations from what is normal for their cultivation areas.

The experimental questionnaire was developed by the German Federal Biological Research Center for Agriculture and Forestry (BBA, now JKI), maize breeders and statisticians in Germany (Wilhelm et al., 2004 [35]). Its questions were simplified to be easily understood by farmers and not to be too burdensome. Also, it had to be sufficiently pragmatic to take into account real commercial situations.

The questionnaire approach was applied for the first time in 2005 and adapted based on that year's experience to create a new version for 2006 survey. The format of the questionnaire is reviewed on a yearly basis based on the outcome of the latest survey. As appropriate, adjustments are made to improve the statistical relevance of the collected data. In 2009, the questionnaire was also adapted according to DG Environment feedback (13 March 2009) and discussions within EuropaBio (see Appendix B).

The questionnaire is organized around collecting data in four specific areas:

Part 1: Maize grown area

Part 2: Typical agronomic practices to grow maize on your farm

Part 3: Observations of MON 810

Part 4: Implementation of *BT* maize specific measures

Part 1 records general, basic data on maize cultivation, cultivation area and local pest and disease pressure (independent from GM or non-GM cultivation - background and possible influencing factors). The objectives of **Part 2** are to establish what the normal practices of conventional cultivation are. It therefore establishes a baseline to which information generated in *Bt* areas can be compared. **Part 3** collects data on MON 810 practices and observations.

The aim of the survey is to identify potential adverse effects that might be related to MON 810 plants and their cultivation. For that reason, most questions are formulated to get ordinary data, i.e. with three possible answers ($Plus$/ $As\ usual$/ $Minus$). The $Plus$- and $Minus$-answers indicate a deviation from the situation with conventional maize and are provided with a specification to describe the specific effect and its potential cause. High frequency (> 10 %) of $Plus$ or $Minus$-answers would indicate possible effects (see Section 2.4).

In addition, Monsanto used this questionnaire to check if farmers are in compliance with the MON 810 cultivation recommendations. For that purpose, the answers and free remarks in **Part 4** were evaluated.

Coding of personal data

For confidentiality reasons and for identification, each questionnaire was assigned a unique code where personal data were coded according to the following format:

2	0	0	9	-	0	1	-	M	A	R	-	E	S	-	0	1	-	0	1	-	0	1

year — event code — partner code — country code — interviewer code — farmer code — area code

Codes:

Event:	01	MON 810
	02	NK603
	03	...

Partner:	MON	Monsanto
	MAR	Markin
	AGR	Agro.Ges
	...	...
Country:	ES	Spain
	PT	Portugal
	PL	Poland
	...	...
Interviewer:	01	A
	02	B
	03	...
Farmer:	incremental counter within the interviewer	
Area:	incremental counter within the farmer	

(e.g. 2009-01-MAR-ES-01-01-01). The data were stored and handled in accordance with the Data Protection Directive 95/46/EC [12]. This is in order to ensure an honest response and to avoid competitive intelligence.

Training of the interviewers

To assist the interviewers in filling in the questionnaires with the farmers, a 'user manual' was developed. While questions have been carefully phrased to obtain accurate observations from farmers, previous experience with the questionnaire may increase awareness and thus result in slightly inconsistent observations from one year to the next.
Additionally, all interviewers have been trained to understand the background of the questions. Here also experience gained during previous years surveys (uncertainties, misinterpretation of questions) could be shared.

2.2 Definition of monitoring characters

The main focus of the questionnaire was the survey of several monitoring characters that were derived from protection goals like soil function, plant health and sustainable agriculture. Table 2.1 provides an overview on the monitored characters and the protection goals that are addressed by them.

Table 2.1: Monitoring characters and corresponding protection goals

Monitoring characters	Protection goals
Time of planting	Sustainable agriculture
Tillage and planting technique	Sustainable agriculture
Insect control practices	Sustainable agriculture
Weed control practices	Sustainable agriculture
Fungal control practices	Sustainable agriculture
Fertilizers application	Sustainable agriculture, soil function
Irrigation practice	Sustainable agriculture
Time of harvest	Sustainable agriculture, plant health
Germination vigor	Plant health
Time to emergence	Plant health
Time to male flowering	Plant health
Plant growth and development	Plant health, soil function
Incidence of stalk/ root lodging	Plant health
Time to maturity	Sustainable agriculture, plant health
Yield	Plant health, soil function
Occurrence of MON 810 volunteers	Sustainable agriculture
Disease susceptibility	Sustainable agriculture, plant health, biodiversity
Insect pest control (Ostrinia nubilalis, Sesamia spp.)	Plant health, sustainable agriculture
Pest susceptibility	Sustainable agriculture, plant health, biodiversity
Weed pressure	Sustainable agriculture, soil function, biodiversity
Occurrence of wildlife (insects, birds, mammals)	Sustainable agriculture, plant health, biodiversity
Feed use	Animal health
Additional observations	All

Note: only the main corresponding protection goals are listed. However, each of the monitoring characters is addressing most of the protection goals, e.g.: all the characters that concur to demonstrate the agronomic equivalence of MON 810 to conventional maize are addressing impact on biodiversity.

The data for the monitoring characters were surveyed on a qualitative scale by asking farmers for their assessment of the situation compared to conventional cultivation. For most questions, three possible categories of answers were given: $As\ usual$, $Plus$ (e.g. later, higher, more) or $Minus$ (e.g. earlier, lower or less) (see Table 2.2).

Table 2.2: Monitoring characters and their categories

Monitoring characters - observations of MON 810	$Minus$	$As\ usual$	$Plus$
Time of planting	Earlier	As usual	Later
Tillage and planting technique	-	As usual	Changed
Insect control practices	-	As usual	Changed
Weed control practices	-	As usual	Changed
Fungal control practices	-	As usual	Changed
Fertilizer application	-	As usual	Changed
Irrigation practice	-	As usual	Changed
Time of harvest	Earlier	As usual	Later
Germination vigor	Less	As usual	More
Time to emergence	Accelerated	As usual	Delayed
Time to male flowering	Accelerated	As usual	Delayed
Plant growth and development	Accelerated	As usual	Delayed
Incidence of stalk/root lodging	Less	As usual	More
Time to maturity	Accelerated	As usual	Delayed
Yield	Lower	As usual	Higher
Occurrence of MON 810 volunteers	Less	As usual	More
Disease susceptibility	Less	As usual	More
Insect pest control (Ostrinia nubilalis)	Weak	Good	Very good
Insect pest control (Sesamia spp.)	Weak	Good	Very good
Pest susceptibility	Less	As usual	More
Weed pressure	Less	As usual	More
Occurrence of insects	Less	As usual	More
Occurrence of birds	Less	As usual	More
Occurrence of mammals)	Less	As usual	More
Performance of fed animals	-	As usual	Different

2.3 Definition of influencing factors

Additionally, several possible influencing factors were surveyed to assess the local conditions and to determine the cause of potential effects in the monitoring characters (Table 2.3).

Table 2.3: Monitored influencing factors

Type	Factor
Site	Soil characteristics
	Soil quality
	Humus content
Cultivation	Crop rotation
	Soil tillage
	Planting technique
	Weed and pest control practices
	Application of fertilizer
	Irrigation
	Time of sowing
	Time of harvest
Environment	Local pest pressure
	Local disease pressure
	Local occurrence of weeds

2.4 Definition of baselines, effects and statistical test procedure

Normally - if there is no effect of MON 810 cultivation or other influencing factors, and the question being well formulated and unambiguous - one would expect a balanced distribution of the frequencies for the three categories with a predominant part of the farmers assessing the situation to be as usual for a certain monitoring character. Small frequencies of differing answers result for example from uncertainty or environmental impacts and are expected to be balanced in both $Minus$ and $Plus$ direction and to run up to approximately 5% (Figure 2.1). Therefore the ***baseline*** for the analysis of monitoring characters with categories $Minus$, $As\ usual$ and $Plus$ is set by a probability pattern 5% - 90% - 5%.

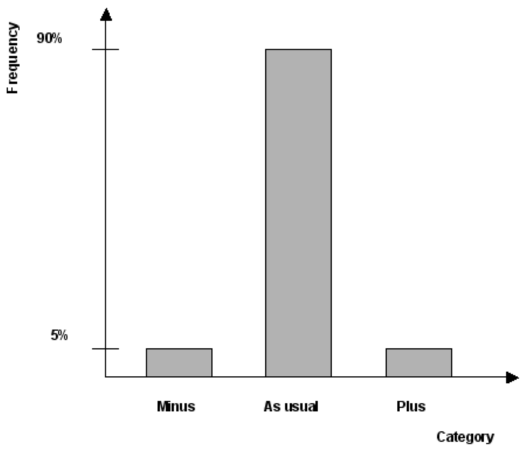

Figure 2.1: Balanced (expected) baseline distribution of the farmers´ answers (no effect)

An effect of the cultivation of MON 810 or any other influencing factor would arise in a greater percentage of $Plus$ or $Minus$ answers, where “greater” or an ***effect***, was quantitatively defined by an increase of at least 5% compared to the baseline. Consequently, a threshold of 10% for the frequencies of $Plus$ (f_{plus}) or $Minus$ (f_{minus}) answers is determined for identifying an effect (Figure 2.2). Graphically, an effect would be expressed by an unbalanced distribution (Figure 2.3 a and b). A distribution that is balanced but with a low percentage of $As\ usual$ answers would not indicate an effect but a badly formulated or ambiguous question (Figure 2.4).

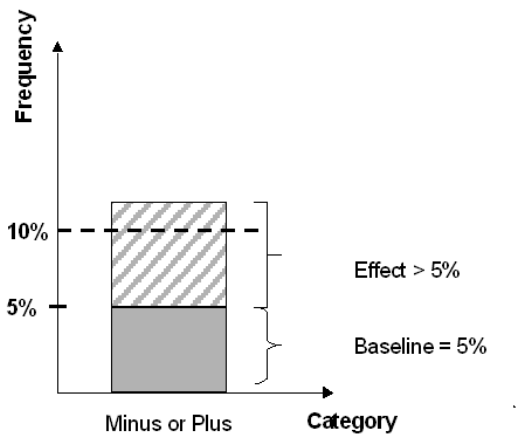

Figure 2.2: Definition of baseline and effect

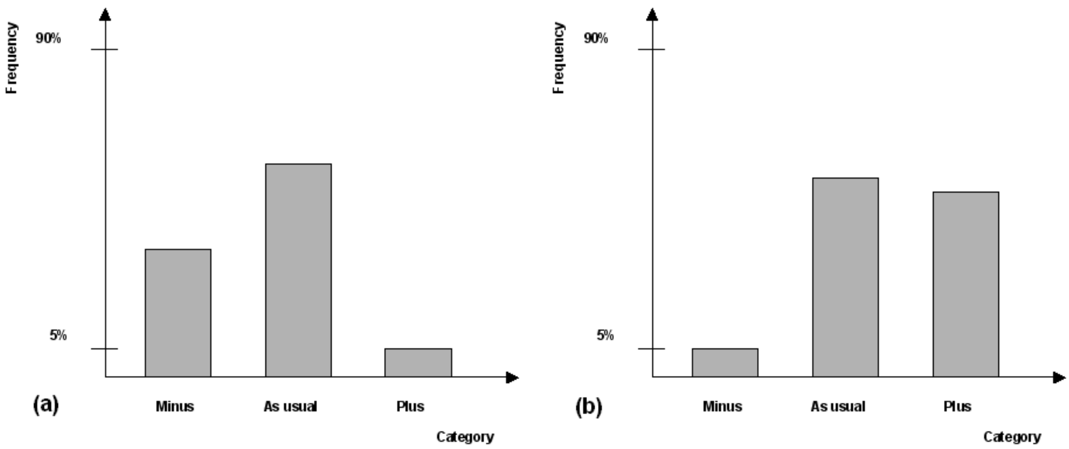

Figure 2.3: Examples for distributions of farmers' answers indicating an effect
(a) $> 10\%$ in category $Minus \rightarrow$ effect, (b) $> 10\%$ in category $Plus \rightarrow$ effect

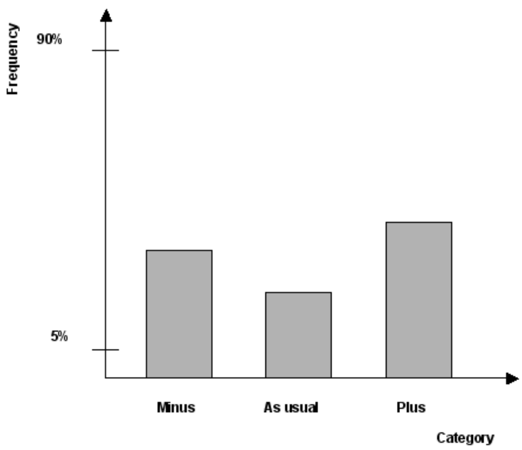

Figure 2.4: Examples for distributions of farmers' answers indicating an ambiguous question

Therefore, to identify an effect within the data means to test the frequencies of the $Plus$ or $Minus$ answers statistically against the threshold of 10%. For both directions two independent null hypotheses can be formed and statistically tested:

$$H_{0_1} : f_{minus} \geq 0.1 = f_{0_1} \qquad H_{0_2} : f_{plus} \geq 0.1 = f_{0_2}$$
$$H_{A_1} : f_{minus} < 0.1 \qquad H_{A_2} : f_{plus} < 0.1$$

Consequently the analysis of each monitoring character is to be performed according to the following scheme:

1. The frequencies of the farmers answers for the three categories are calculated. The calculation of frequencies and their percentages is done both on the basis of all and on the basis of valid answers. When farmers gave no statement, these answers are accounted as missing

values and therefore not considered valid. As a consequence, the "valid percentages" state the proportions of the several categories of an answer that are really known, whereas the "percentages" only specify the proportions of the categories within the whole answer spectrum, including no answers. Additionally, the accumulated valid percentages are calculated for illustrating the distribution function and for quality control reasons.

2. The frequencies of $Plus$ and/or $Minus$ answers are statistically tested against the threshold of 10%. The resulting P values are compared to a level of significance $\alpha = 0.01$. If P is less than $\alpha = 0.01$, the null hypothesis ($f_{minus} \geq 10\%$ or $f_{plus} \geq 10\%$) is rejected and thus no effect can be identified. In case of a P value greater than 0.01, the null hypothesis can not be rejected and an effect is indicated. In cases where the estimated frequencies are less than 10% but the corresponding P values greater than $\alpha = 0.01$ (and therefore those frequencies are not significantly less than 10%) the 99% confidence intervals for the frequencies are also calculated to better assess the severity of such test decisions.

3. Where an effect is indicated, the effect must be interpreted (adverse/ beneficial).

4. Where an adverse effect was identified, the cause of the effect was ascertained (MON 810 cultivation, other influencing factors).

5. Identification of adverse effects potentially caused by MON 810 cultivation, would require further examinations. (Such cases, however, have not been found in the 2009 data.)

2.5 Sample size determination

The sample size determination of the survey was based on the statistical tests described above. A total sample size of 2500 questionnaires was determined to meet certain accuracy demands (threshold for adverse effects to be tested: 10% of $Minus$ (or $Plus$) answers, error of the first kind: $\alpha = 0.01$, error of the second kind: $\beta = 0.01$, effect size: $d = 3.5\%$ (CADEMO light [6])) for a survey lasting 10 years (duration of approval). Therefore, the aim is to conduct approximately 250 questionnaires per year.

The farmers/fields were randomly selected between the countries depending on the grade of market maturity; theoretically within each country each field of MON 810 cultivation had the same chance to be surveyed. The GS for MON 810 was focused on the geographical regions within the European Union (EU) where MON 810 was grown in 2009 (Czech Republic, Portugal, Slovakia, Spain, Poland, Romania) and took place in representative environments, reflecting the range and distribution of farming practices and environments exposed to MON 810 plants and their cultivation. Taking into account the grade of market maturity, a certain subset of farmers in Czech Republic, Portugal, Slovakia, Spain, Poland and Romania were asked to fill in the questionnaire. In Spain, the largest market, the surveys (100) were performed by Markin[1] , in Portugal 42 surveys were performed by Agro.Ges[2] and in Romania 40 surveys were performed by MIA[3] . This companies have an

[1] Instituto Markin, SL; c/ Caleruega, 60 4º D - 28033 Madrid - Spain
[2] Agro.Ges - Sociedade de Estudos e Projectos, Av. da República, 412, 2750-475 Cascais - Portugal
[3] MIA Marketing Institute Ltd., 17 Unirii Blvd., Bl. 4A, Sc. 2, 3rd Floor, Sector 5, Bucharest - Romania

established experience in agricultural surveys. In Czech Republic and Slovakia the surveys (55) were performed by the Czech Agriculture University[4]. In Poland Monsantos field representatives assisted the farmers in filling in the questionnaire (3).

2.6 Power of the Test

The power of the test $f_{minus} \geq 0.1 = f_{0_1}$ or $f_{plus} \geq 0.1 = f_{0_2}$ is the probability to detect a frequency of $Plus$ or $Minus$ answers smaller than 0.1, i.e. the ability that no effect exists. It is calculated as followed:

$$Power = \sum_{F=0}^{F_U-1} \left(\frac{n!}{F!\,(n-F)!} \right) f^F \,(1-f)^{n-F}$$

while:

$$F_U = \min_F \left(P\left(F \leq F_E | H_0\right) > \alpha \right)$$

$f =$ given frequency of $Plus$ or $Minus$ answers for which the power is calculated

$F_E =$ absolute frequency of $Plus$ or $Minus$ answers

A frequency of 5% of $Plus$ or $Minus$ answers (baseline, no effect!) with the given sample size of 250 and a probability value $\alpha = 0.01$ will be detected with a power of 73% (Figure 2.5). The power increases for frequency values smaller than 5% and decreases for frequency values greater than 5%.

For a frequency of 10% the power is close to 0, i.e. in this case the test will not fail and we will not recognize an existing effect. In conclusion, the power of the test as it is currently designed for a one year analysis based on 250 questionnaires is very high.

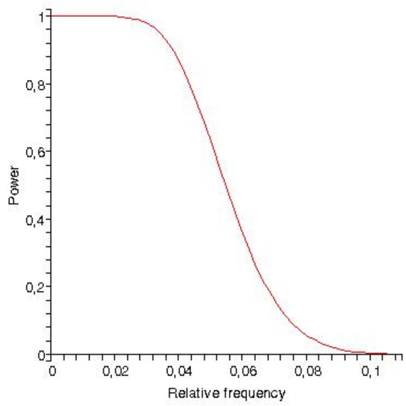

Figure 2.5: Function of the power of the test with a sample size number of 250 and a probability value of $\alpha = 0.01$

[4]Czech Agricultural University, Kamýcká 129, Praha 6 - Suchdol, 165 21 Czech Republic

2.7 Data management and quality control

A database was developed for data management and storage. For each question a variable was defined by a variable name (eight-digit in maximum) and a variable label (short description of the question). The variables were specified according to their type (qualitative or quantitative), format etc. Missing values were defined (-1: no statement, -2: not readable). For not readable entries in the questionnaires, queries were formulated and the field representatives or farmers were asked for explanation. These entries in the database were corrected. For quantitative variables (e.g. total maize area in ha) the real values from the questionnaire were taken for the database, for qualitative variables the possible parameter values (e.g. Plus/as usual/Minus) were defined and coded (and only the code values taken).

The database actually contains 1079 cases (questionnaires): 251 for the 2006 field season, 291 for the 2007 field season, 297 for the 2008 field season and 240 for the 2009 field season.

All data were entered and controlled for their quality and plausibility.

A quality control check of the 240 cases for the 2009 field season looked at each variable for completeness (unacceptable missing values like -2: unreadable) and correctness (quantitative values within a plausible min-max range, qualitative values only with acceptable parameter values). Plausibility control checked the variable values for their contents, both to find incorrect answers and to prove the logical connections between different questions. It also looked for the consistency between $Plus/Minus$-answers and specifications, i.e. whether all these answers were provided with a specification and whether the specifications really substantiated the $Plus/Minus$-answers.

Chapter 3

Results

The questionnaires have been completed between November 2009 and January 2010. In the 2009 growing season 240 farm questionnaires have been collected.

Quality and plausibility control confirmed that all 240 questionnaires could be considered for analysis. This good quality also resulted from the interviewer training.

With the sample size of 240 instead of 250 questionnaires the power of the test $f_{minus} \geq 0.1 = f_{0_1}$ or $f_{plus} \geq 0.1 = f_{0_2}$ is less than described in chapter 2.6. In this case one can expect to reject the null hypothesis with a probability of 68% for a relative frequency of $Plus$ or $Minus$ answers of $f_E = 5\%$ or smaller.

In most cases, the frequencies for the three categories of the monitoring characters show the expected balanced distribution. In some cases, deviations are identified.

An overview of numbers, percentages and levels of significance of the binomial tests of the data in 2009 is given in Table 3.1. The fields highlighted in grey mark the cases with frequencies significantly greater than 10%, and therefore indications for an effect. Summing up, 2009 data indicates that in comparison to conventional maize plants, MON 810 plants

- received less insecticides,
- were harvested later,
- germinated more vigorously,
- grew and developed slightly faster,
- had less incidence of stalk/root lodging,
- had a longer time to maturity,
- gave a higher yield,
- were observed less as volunteers from previous year's planting,
- were less susceptible to diseases,
- controlled corn borers very well, and
- were less susceptible to pests, other than corn borers, especially lepidopteran pests.

Moreover the animals fed with MON 810 performed slightly different compared to them fed with conventional maize.

Table 3.1: Overview on the results of the descriptive analysis of the monitoring characters in 2009

Monitoring characters[1]	N valid	*Minus*[1]	P for $p_0 = 0.1$	*As usual*[1]	*Plus*[1]	P for $p_0 = 0.1$
Crop rotation	240			238 (99,2%)	2 (0,8%)	< 0.01
Time of planting	240	7 (2,9%)	< 0.01	230 (95,8%)	3 (1,3%)	< 0.01
Tillage and planting technique	239			239 (100.0%)	0 (0.0%)	< 0.01
Insect control practices	240			196 (81.7%)	44 (18.3%)	1.0
Weed control practices	240			240 (100.0%)	0 (0.0%)	< 0.01
Fungal control practices	240			239 (99.6%)	1 (0.4%)	< 0.01
Maize Borer control practice	240			240 (100.0%)	0 (0.0%)	< 0.01
Fertiliser Application	240			239 (99.6%)	1 (0.4%)	< 0.01
Irrigation Practices	240			240 (100.0%)	0 (0.0%)	< 0.01
Time of harvest	240	5 (2.1%)	< 0.01	216 (90.0%)	19 (7.9%)	0.167
Germination vigour	239	2 (0.8%)	< 0.01	202 (84.5%)	35 (14.6%)	0.991
Time to emergence	239	13 (5.4%)	< 0.01	224 (93.7%)	2 (0.8%)	< 0.01
Time to male flowering	239	5 (2.1%)	< 0.01	230 (96.2%)	4 (1.7%)	< 0.01
Plant growth and development	239	14 (5.9%)	0.016	220 (92.1%)	5 (2.1%)	< 0.01
Incidence of stalk / root lodging	238	76 (31.9%)	1.0	162 (68.1%)	0 (0.0%)	< 0.01
Time to maturity	239	7 (2.9%)	< 0.01	197 (82.4%)	35 (14.6%)	0.991
Yield	239	4 (1.7%)	< 0.01	99 (41.4%)	136 (56.9%)	1.0
Occurrence of volunteers	195	21 (10.8%)	0.692	174 (89.2%)	0 (0.0%)	< 0.01
Disease susceptibility	239	70 (29.2%)	1.0	168 (70.2%)	1 (0.4%)	< 0.01
Insect pest control (*Ostrinia nubilalis*)	239	1 (0.4%)	< 0.01	14 (5.9%)	224 (93.7%)	1.0
Insect pest control (*Sesamia* spp.)	142	0 (0.0%)	< 0.01	1 (0.7%)	141 (99.3%)	1.0
Pest susceptibility	238	41 (17.2%)	1.0	194 (81.5%)	3 (1.3%)	< 0.01
Weed pressure	239	5 (2.1%)	< 0.01	234 (97.9%)	0 (0.0%)	< 0.01
Occurrence of insects	231	2 (0.9%)	< 0.01	227 (98.3%)	2 (0.9%)	< 0.01
Occurrence of birds	231	1 (0.4%)	< 0.01	230 (99.6%)	0 (0.0%)	< 0.01
Occurrence of mammals	232	2 (0.9%)	< 0.01	227 (97.8%)	3 (1.3%)	< 0.01
Performance of animals	56			51 (91.1%)	5 (8.9%)	0.507

Grey highlighted values are significantly greater than 10%

[1] Monitoring characters and their categories are defined in section 2.2

In the following sections the detailed analysis of all parameters surveyed using the questionnaire in 2009 is described and the results are assessed scientifically.

3.1 Part 1: Maize grown area

3.1.1 Location

In 2009 240 questionnaires were surveyed in the cultivation areas of MON 810 in 6 European countries. On average, 12.5% of the total planted MON 810 surfaces were monitored during the 2009 survey (Table 3.2).

Table 3.2: MON 810 cultivation and monitored areas in 2009

Country	Total planted MON 810 surfaces (ha)	Monitored MON 810 surfaces (ha)	Monitored MON 810 surfaces / total planted MON 810 surfaces (%)
Czech Republic	6480	4430	68.4
Poland	ca. 3000	39	1.3
Portugal	5094	2006	39.4
Romania	3344	2483	74.2
Slovakia	875	794	90.7
Spain	76057	2107	2.8
Total	94850	11857	12.5

Figure 3.1 shows a geographical overview on the main cultivation areas of MON 810 in Europe in 2009 (grey areas) and the location of the monitoring sites (numbers).

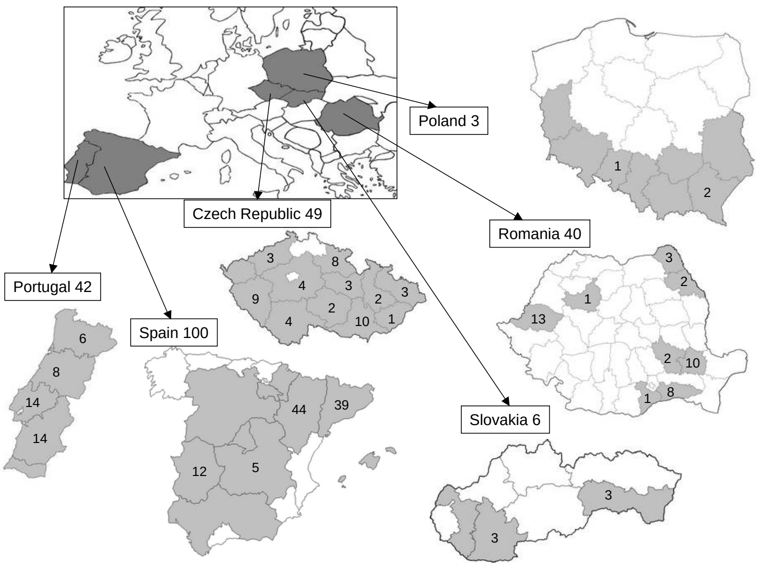

Figure 3.1: Number of sampling sites within the cultivation areas (grey) of MON 810 in Europe in 2009

3.1.2 Surrounding environment

The farmers were asked to describe the land usage in the surrounding of the areas planted with maize. The most of the fields (93.3%) are surrounded by farmland and only a few (4.2%) by forest and wild habitats (Table 3.3, Figure 3.2).

Table 3.3: Land usage in the surrounding of the areas planted with MON 810 in Europe in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	Farmland	224	93.3	93.3	93.3
	Forest or wild habitat	10	4.2	4.2	97.5
	Farmland and Forest or wild habitat	6	2.5	2.5	100.0
Total		240	100.0	100.0	

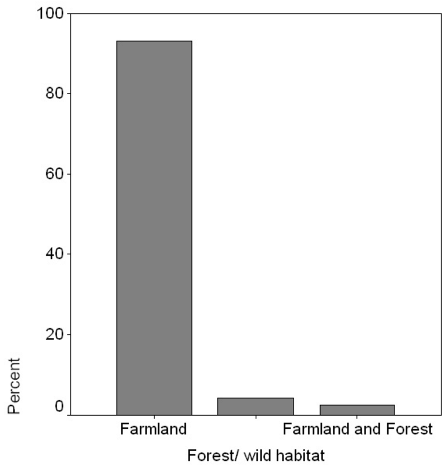

Figure 3.2: Land usage in the surrounding of the areas planted with MON 810 in Europe in 2009

3.1.3 Size and number of fields of the maize cultivated area

The size of the maize area of the farmers cultivating MON 810 in 2009 ranged from 2.5 to 6869.0 hectares with an overall mean of 178.7 hectares. MON 810 was cultivated in 2009 on 49.4 hectares in average (minimum 1.0; maximum 1114.0 hectares). Details for cultivation of maize in 2006, 2007, 2008 and 2009 by country can be found in Table 3.5.

Figure 3.3 shows the mean percentage of MON 810 cultivation area within total maize area per farmer from 2006 to 2009.

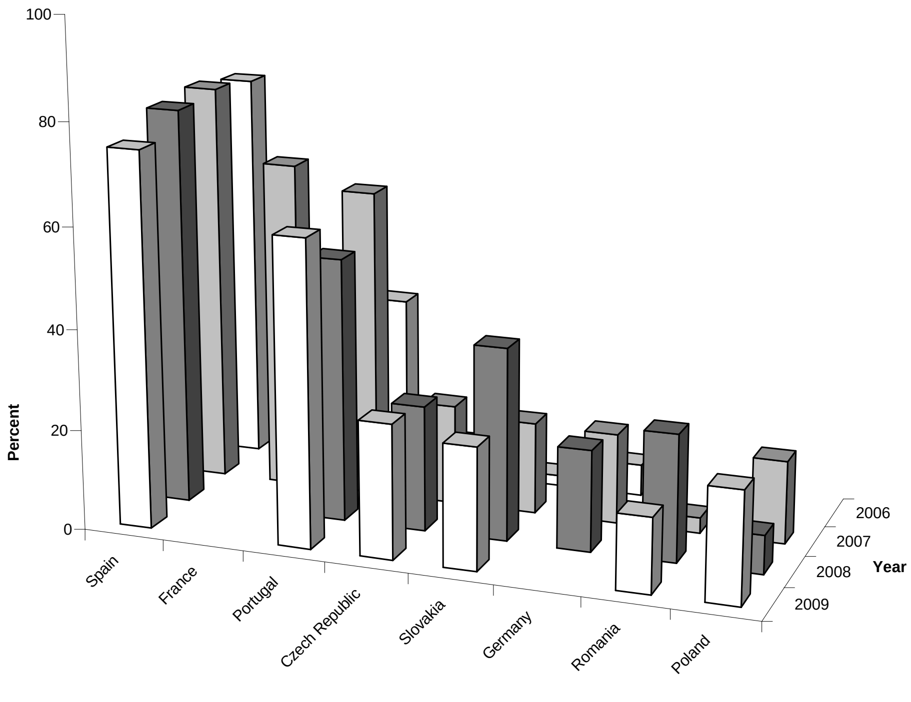

Figure 3.3: Mean percent of MON 810 cultivation area of total maize area per farmer in 2006, 2007, 2008 and 2009

In 2009 MON 810 was cultivated on one up to 35 fields per farm. In average every farmer cultivated MON 810 on nearly 4 fields (Table 3.4).

Table 3.4: Number of fields with MON 810 in 2009

Valid N	Mean	Minimum	Maximum	Sum
240	3.96	1	35	951

Table 3.5: Maize area (ha) per surveyed farmer in 2006, 2007, 2008 and 2009

		2006			2007			2008			2009		
Country	Total Area (ha)	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Spain	all maize	26.9	1.0	204.0	31.6	1.0	210.0	31.6	1.5	294.0	28.3	3.0	260.0
	MON 810	21.0	1.0	170.0	25.2	1.0	200.0	24.9	0.5	266.0	21.1	2.0	200.0
France	all maize	80.4	9.6	500.0	54.6	6.0	500.0	-	-	-	-	-	-
	MON 810	18.3	0.4	104.0	35.8	2.0	150.0	-	-	-	-	-	-
Portugal	all maize	100.3	10.0	278.0	89.3	7.0	470.0	78.6	10.0	350.0	78.8	8.0	310.0
	MON 810	35.3	3.0	130.0	54.8	0.8	320.0	41.1	2.5	240.0	47.8	1.0	250.0
Czech	all maize	424.6	52.0	2500.0	433.8	89.3	1400.0	431.9	57.4	3000.0	338.9	8.4	789.1
Republic	MON 810	28.2	1.5	125.0	86.3	19.5	466.0	107.6	10.0	561.1	90.4	6.5	500.0
Slovakia	all maize	491.7	65.0	1300.0	277.2	20.0	659.4	340.2	124.0	637.3	546.7	270.0	895.0
	MON 810	10.0	10.0	10.0	50.6	10.0	174.6	130.1	10.0	400.0	132.3	50.0	285.0
Germany	all maize	274.8	39.0	1110.0	239.5	20.0	1130.0	256.1	4.8	1470.0	-	-	-
	MON 810	17.3	1.0	50.0	43.0	0.5	166.0	51.6	0.2	200.0	-	-	-
Romania	all maize	-	-	-	1969.8	253.0	5616.0	591.4	5.4	6789.0	417.5	2.5	6869.0
	MON 810	-	-	-	61.4	0.5	216.0	149.0	2.0	2705.0	62.1	1.0	1114.0
Poland	all maize	-	-	-	79.0	20.0	130.0	222.7	4.2	940.0	58.0	39.0	95.0
	MON 810	-	-	-	13.0	11.0	15.0	17.0	4.2	50.0	12.8	5.5	25.0

3.1.4 Maize varieties grown

The farmers were asked to list up to five MON 810 varieties and up to five conventional maize varieties that they cultivated in 2009 on their farm. 58 different MON 810 varieties and 163 different conventional maize varieties were listed. The most named varieties (at least 6 times) and the frequencies are listed in Table 3.6.

Table 3.6: Names of most cultivated MON 810 and conventional maize varieties in 2009

MON 810 varieties		Conventional varieties	
Variety	Frequency	Variety	Frequency
BELES SUR YG	6	DK 440	22
DKC 3421 YG	22	DKC 3511	30
DKC 3512 YG	39	DKC 4490	9
DKC 3946 YG	26	DKC 4626	18
DKC 4442 YG	40	DKC 5143	17
DKC 5018 YG	31	DKC 5783	7
DKC 5784 YG	21	DKC 6666	18
DKC 6041 YG	8	Latizana	7
DKC 6451 YG	21	PR 32 T 83	11
DKC 6575 YG	6	PR 33 A 46	12
DKC 6667 YG	6	PR 33 P 66	24
KURATUS YG	9	PR 33 Y 74	17
Kvalitas YG	8	PR 34 N 43	23
MEB 483 BT	20	PR 34 P 88	6
PR 31 N 28 YG	21	PR 34 Y 02	6
PR 32 G 49 YG	31	Ronaldinio	7
PR 32 R 43 YG	8	Sancia	6
PR 32 W 04 YG	8		
PR 33 P 67 YG	44		
PR 34 N 44 YG	38		
PR 39 F 56 YG	9		

3.1.5 Soil characteristics of the maize grown area

To assess the possible influence of the soil on monitoring characters data on soil characteristics, quality and carbon content were surveyed. Table 3.7 summarizes the reported soil types of the maize grown area.

Table 3.7: Predominant soil type of maize grown area in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	very fine (clay)	7	2.9	2.9	2.9
	fine (clay, sandy clay, silty clay)	48	20.0	20.0	22.9
	medium (sandy clay loam, clay loam, sandy silt)	86	35.8	35.8	58.8
	medium-fine (silty clay loam, silt loam)	37	15.4	15.4	74.2
	coarse (sand, loamy sand, sandy loam)	20	8.3	8.3	82.5
	no predominant soil type (different soil types)	41	17.1	17.1	99.6
	I do not know	1	0.4	0.4	100.0
Total		240	100.0	100.0	

Farmers responses regarding the quality of the soil of the area grown with maize are given in Table 3.8, Figure 3.4. 95.8% (230/240) of the maize was grown on normal or good soil according to the response of the farmers. The highest percentages of poor soil quality were found in Czech Republic (10.2%, 5/49) and Portugal (9.5%, 4/42).

Table 3.8: Soil quality of the maize grown area as assessed by the farmers in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	above average - good	76	31.7	31.7	31.7
	average - normal	154	64.2	64.2	95.8
	below average - poor	10	4.2	4.2	100.0
Total		240	100.0	100.0	

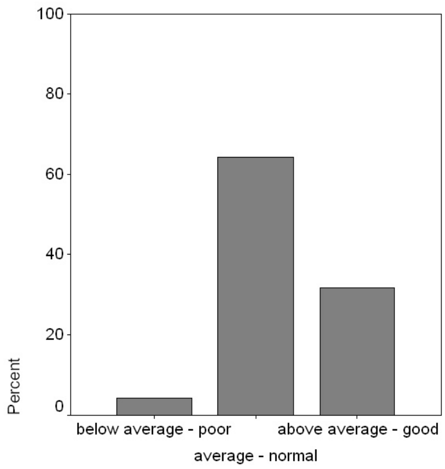

Figure 3.4: Soil quality of the maize grown area as assessed by the farmers in 2009

82 farmers were able to specify the humus content (not a commonly known measure all over Europe), which ranged from 0.7 to 5.0 with a mean of 2.3 (Table 3.9). 204 farmers did not specify the humus content: 99.0% (99/100) of the Spanish, 0.0% (0/42) of the Portuguese, 83.7% (41/49) of the Czech, 83.3% (5/6) of the Slovak, 25.0% (10/40) of the Romanian and 100% (3/3) of the Polish farmers.

Table 3.9: Humus content (%) in 2009

Valid N	Mean	Minimum	Maximum	Missing N
82	2.3	0.7	5.0	204

3.1.6 Local disease, pest and weed pressure in maize

Data of local disease, pest and weed pressure in maize are collected to find out if these environmental data have any influence on the values of the monitoring characters. These data differ from year to year and depend on the cultivation area and reflect only the assessment of the farmer.

Local disease pressure as assessed by the farmers

The local disease pressure (fungal, viral) in maize was assessed to be low or as usual by 97.5% (234/240) of the farmers (Table 3.10, Figure 3.5). From the 66 farmers who assessed the pressure to be low, 33.3% (20/66) came from Spain and 28.8% (19/66) came from Portugal. 2.5% (6/240) stated it as high, where 33.3% (2/6) of them came from Spain, 33.3% (2/6) from Romania, one (16.7%) from Portugal and one (16.7%) from Czech Republic.

Table 3.10: Farmers assessment of the local disease pressure (fungal, viral) in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	low	66	27.5	27.5	27.5
	as usual	168	70.0	70.0	97.5
	high	6	2.5	2.5	100.0
Total		240	100.0	100.0	

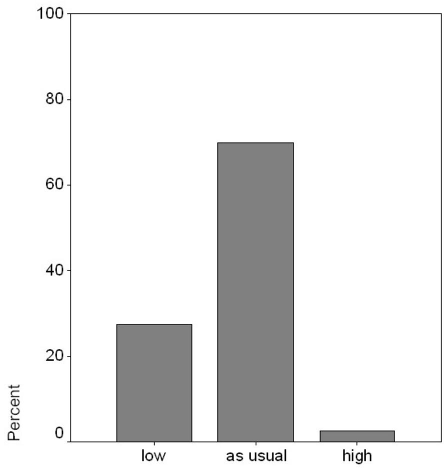

Figure 3.5: Farmers assessment of the local disease pressure (fungal, viral) in 2009

Local pest pressure as assessed by the farmers

Regarding the local pest pressure (insects, mites, nematodes), 92.9% (223/240) of the farmers evaluated it to be low or as usual and 7.1% (17/240) evaluated it to be high (Table 3.11, Figure 3.6).

53.2% (42/79) of the farmers assessing high pest pressure came from Spain, 47.1% (8/17) of the farmers with low pest pressure came from Portugal.

Table 3.11: Farmers assessment of the local pest pressure (insects, mites, nematodes) in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	low	79	32.9	32.9	32.9
	as usual	144	60.0	60.0	92.9
	high	17	7.1	7.1	100.0
Total		240	100.0	100.0	

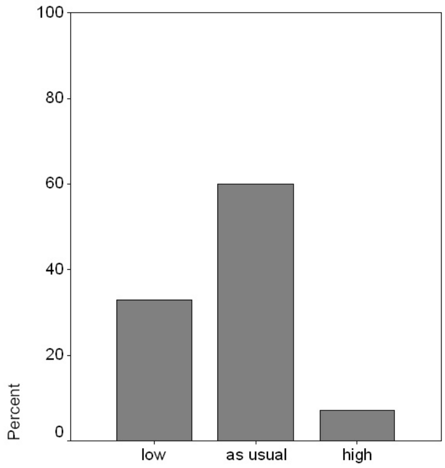

Figure 3.6: Farmers assessment of the local pest pressure (insects, mites, nematodes) in 2009

Local weed pressure as assessed by the farmers

77.5% (186/240) assessed the local weed pressure to be low or as usual and 22.5% (54/240) evaluated it to be high (Table 3.12, Figure 3.7). 51.9% (28/54) of the farmers with high weed pressure came from Portugal. 50.0% (13/26) who evaluated it to be low came from Spain.

Table 3.12: Farmers assessment of the local weed pressure in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	low	26	10.8	10.8	10.8
	as usual	160	66.7	66.7	77.5
	high	54	22.5	22.5	100.0
Total		240	100.0	100.0	

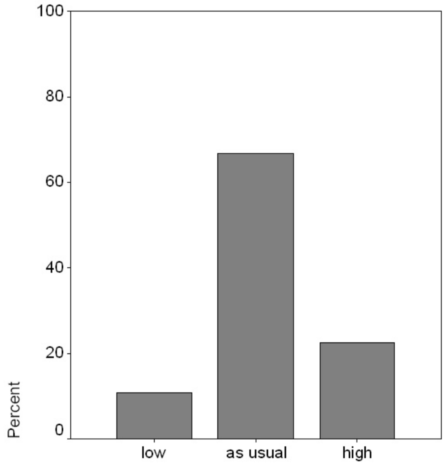

Figure 3.7: Farmers assessment of the local weed pressure in 2009

3.2 Part 2: Typical agronomic practices to grow maize

3.2.1 Irrigation of maize grown area

64.6% (155/240) irrigated their fields (Table 3.13): 100% (100/100) of the Spanish, 100% of the Portuguese (42/42), 30.0% (12/40) of the Romanian and 16.7% (1/6) of the Slovakian farmers. In Czech Republic and Poland the farmers did not irrigate their maize grown area. The irrigation of the maize grown area is a productivity factor. These data reflect the general practices in Europe. The irrigation depends on the weather conditions, even though it could be relevant for the analysis of GM maize specific effects.

Table 3.13: Irrigation of maize grown area in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	155	64.6	64.6	64.6
	no	85	35.4	35.4	100.0
Total		240	100.0	100.0	

The most of the irrigating farmers (46.2%) used Sprinkler followed by Gravity (20%) and Pivot (19.5%). Some of them used more than one of the named or other types of irrigation (Table 3.14).

Table 3.14: Type of irrigation in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	Gravity	48	20.0	31.2	31.2
	Sprinkler	71	29.6	46.1	77.3
	Pivot	30	12.5	19.5	96.8
	other	1	0.4	0.6	97.4
	Gravity and Pivot	1	0.4	0.6	98.1
	Gravity and other	2	0.8	1.3	99.4
	Sprinkler and Pivot	1	0.4	0.6	100.0
	Total	154	64.2	100.0	
Missing	no statement	86	35.8		
Total		240	100.0		

3.2.2 Major rotation of maize grown area

The main crop rotation within three years is maize-maize-maize followed by cereals-cereals-maize, maize-cereals-maize and rape-cereals-maize. Some other crop rotations were mentioned, but all with low occurrence (Table 3.15). The group of Legumes contains peas, beans, vetch (Vicia) and Lucerne (Alfalfa).

Table 3.15: Major rotation of maize grown area (two years ago and previous year) sorted by frequency

	two years ago	previous year	Frequency	Percent	Valid percentages	Accumulated percentages
Valid	maize	maize	88	36.7	36.7	36.7
	cereals	cereals	30	12.5	12.5	49.2
	maize	cereals	27	11.3	11.3	60.4
	rape	cereals	20	8.3	8.3	68.8
	cereals	maize	10	4.2	4.2	72.9
	cereals	legumes	8	3.3	3.3	76.3
	legumes	legumes	8	3.3	3.3	79.6
	legumes	maize	8	3.3	3.3	82.9
	sunflowers	cereals	5	2.1	2.1	85.0
	cereals	sunflowers	4	1.7	1.7	86.7
	maize	sunflowers	4	1.7	1.7	88.3
	maize	legumes	3	1.3	1.3	89.6
	legumes	cereals	2	0.8	0.8	90.4
	no cultivation	no cultivation	2	0.8	0.8	91.3
	potato	potato	2	0.8	0.8	92.1
	sunflowers	maize	2	0.8	0.8	92.9
	sunflowers	sunflowers	2	0.8	0.8	93.8
	beet	cereals	1	0.4	0.4	94.2
	beet	potato	1	0.4	0.4	94.6
	cereals	rape	1	0.4	0.4	95.0
	cereals	spices	1	0.4	0.4	95.4
	legumes	sunflowers	1	0.4	0.4	95.8
	maize	potato	1	0.4	0.4	96.3
	maize	rape	1	0.4	0.4	96.7
	no cultivation	cereals	1	0.4	0.4	97.1
	no cultivation	legumes	1	0.4	0.4	97.5
	no cultivation	maize	1	0.4	0.4	97.9
	not specified	beet	1	0.4	0.4	98.3
	not specified	no specified	1	0.4	0.4	98.8
	sunflowers	potato	1	0.4	0.4	99.2
	tomato	maize	1	0.4	0.4	99.6
	tomato	tomato	1	0.4	0.4	100.0
Total			240	100.0	100.0	

3.2.3 Soil tillage practices

The farmers were asked to answer whether they performed soil tillage. 99.2% (238/240) said "yes" (Table 3.16) while 0.8% answered "no". The two farmers who answered "no" came from Spain.

Table 3.16: Soil tillage practices in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	238	99.2	99.2	99.2
	no	2	0.8	0.8	100.0
Total		240	100.0	100.0	

68.0% (174/238) of the farmers who said "yes" and specified the time of tillage performed it in Winter, 29.0% (69/238) in Spring and 5.0% (12/238) in Winter and Spring (Table 3.17, Figure 3.8).

Table 3.17: Time of tillage in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	Winter	157	66.0	66.0	66.0
	Spring	69	29.0	29.0	95.0
	Winter + Spring	12	5.0	5.0	100.0
Total		238	100.0	100.0	

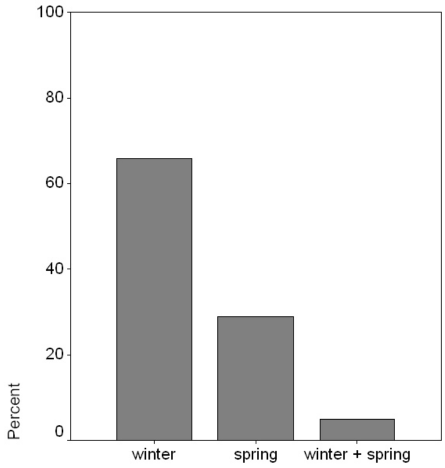

Figure 3.8: Time of tillage in 2009

3.2.4 Maize planting technique

85.4% (205/240) of the farmers used conventional maize planting techniques, 9.2% (22/240) mulch and 1.7% (4/240) used direct sowing. 3.7% of the farmers used two different of the above mentioned maize planting techniques on different fields (Table 3.18, Figure 3.9).

Table 3.18: Maize planting technique in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	conventional planting	205	85.4	85.4	85.4
	mulch	22	9.2	9.2	94.6
	direct sowing	4	1.7	1.7	96.3
	conventional + mulch	6	2.5	2.5	98.8
	conventional + direct sowing	2	0.8	0.8	99.6
	mulch + direct sowing	1	0.4	0.4	100.0
Total		240	100.0	100.0	

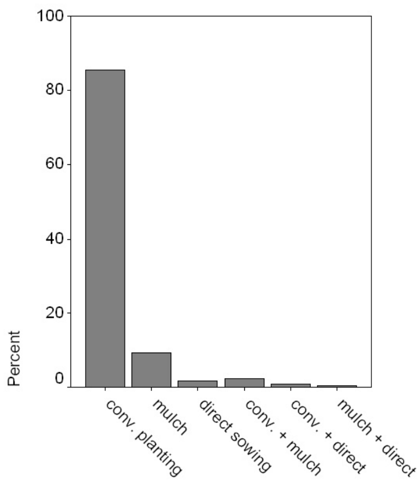

Figure 3.9: Maize planting technique in 2009

3.2.5 Typical weed and pest control practices in maize

Farmers were asked to specify the typical weed and pest control practices in maize at their farms. 62.1% of all farmers (149/240) used insecticides and 36.9% (55/149) of them using insecticides used insecticides against corn borers. One of the farmers (0.4%) used biocontrol treatments, 99.2% (238/240) used herbicides, 15.4% (37/240) used mechanical weed control and 6.3% (15/240) used fungicides (Table 3.19).

Table 3.19: Typical weed and pest control practices in maize in 2009

Insecticide(s)		Frequency	Percent
	yes	149	62.1
	no	91	37.9
Total		240	100.0
Insecticide(s) against corn borers		Frequency	Percent
	yes	55	36.9
	no	94	63.19
Total		149	100.0
Use of biocontrol treatments		Frequency	Percent
	yes	1	0.4
	no	239	99.6
Total		240	100.0
Herbicide(s)		Frequency	Percent
	yes	238	99.2
	no	2	0.8
Total		240	100.0
Mechanical weed control		Frequency	Percent
	yes	37	15.4
	no	203	84.6
Total		240	100.0
Fungicide(s)		Frequency	Percent
	yes	15	6.3
	no	225	93.8
Total		240	100.0

3.2.6 Application of fertilizer to maize grown area

98.8% of the farmers applied fertilizer to the maize grown area (Table 3.20).

Table 3.20: Application of fertilizer to maize grown area in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	237	98.8	98.8	98.8
	no	3	1.3	1.3	100.0
Total		240	100.0	100.0	

3.2.7 Typical time of maize sowing

For quality control and to see if the collected data are plausible the farmers were asked about the typical time of maize sowing. The time of sowing ranged from 10 March 2009 to 10 July 2009 (Table 3.21).

Table 3.21: Typical time of maize sowing in 2009

	Earliest date	Latest date	Mean	Valid N
Sowing from	10.03.09	20.06.09	14.04.09	240
Sowing till	15.03.09	10.07.09	30.04.09	240

3.2.8 Typical time of maize harvest

The question on the typical time of harvest was also asked for quality control and to see if the collected data are within a plausible range. The time of harvest for maize grain ranged from 20 August 2009 to 31 December 2009 and for maize forage from 10 August 2009 to 15 December 2009 (Table 3.22).

Table 3.22: Typical time of maize harvest in 2009

	Earliest date	Latest date	Mean	Valid N
Harvest grain maize form	20.08.09	01.12.09	07.10.09	215
Harvest grain maize till	26.08.09	31.12.09	28.10.09	215
Harvest forage maize from	10.08.09	20.11.09	07.09.09	87
Harvest forage maize till	25.08.09	15.12.09	20.09.09	87

Possible reasons for such a long time period for the harvest are the dependence of harvest on the maturity group of the maize variety and of course the different weather conditions within the cultivation areas.

3.3 Part 3: Observations of MON 810

3.3.1 Agricultural practices in MON 810 (compared to conventional maize)

Crop rotation

The crop rotation for MON 810 was specified to be as usual in 99.2% (238/240) of the cases (Table 3.23). The two farmers who changed their crop rotation came from Romania. They did rotate maize - cereals previous conventional maize and maize - maize previous MON 810.

Table 3.23: Crop rotation for MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	238	99.2	99.2	99.2
	changed	2	0.8	0.8	100.0
Total		240	100.0	100.0	

The valid percentage of changed crop rotation (0.8%) is significantly less than 10% since the resulting P value is less than the level of significance $\alpha = 0.01$ (Table 3.24). Therefore, the null hypothesis $f_{changed} \geq 0.1$ is rejected with a power of 99,9% and no effect on crop rotation is indicated.

Table 3.24: Results of the binomial test for changed crop rotation for MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240			238 (99.2%)	2 (0.8%)	< 0.01

Planting time

The planting time of MON 810 was specified to be as usual compared to conventional maize by 95.8% (230/240) of the farmers (Table 3.25, Figure 3.10).

Table 3.25: Planting time of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	earlier	7	2.9	2.9	2.9
	as usual	230	95.8	95.8	98.8
	later	3	1.3	1.3	100.0
Total		240	100.0	100.0	

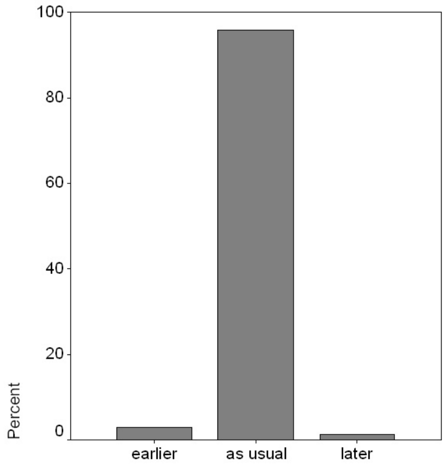

Figure 3.10: Planting time of MON 810 compared to conventional maize in 2009

Both the valid percentage of earlier planting (2.9%) and the valid percentage of later planting (1.3%) are significantly less than 10% since the resulting P values are less than the level of significance $\alpha = 0.01$ (Table 3.26). Therefore, both null hypotheses $f_{earlier} \geq 0.1$ with a power of 98.8% and $f_{later} \geq 0.1$ with a power of 99.9% are rejected and no effect on time of planting is indicated.

Table 3.26: Results of the binomial test for different planting time for MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240	7 (2.9%)	< 0.01	230 (95.8%)	3 (1.3%)	< 0.01

For completeness, although no effect is identified, the main reasons for earlier and later planting of MON 810 are reflected in Table 3.27 and individual specifications for earlier or later planting of MON 810 are given in Appendix A, Table A.1. Again as in the previous years, the farmers essentially mentioned a higher flexibility in the handling because of the lower susceptibility of MON 810 to corn borers and the resulting fitness of the plant and the weather conditions as reasons for earlier or later planting.

Table 3.27: Reasons for different planting time of MON 810 compared to conventional maize in 2009

		Reasons			Total
		flexibility	weather	no statement	
Valid	earlier	0	1	6	7
	later	3	0	0	3
Total		3	1	6	10

Tillage and planting techniques

No farmer has changed the tillage and planting technique of MON 810 compared to that used in conventional maize, as reflected in Table 3.28.

Table 3.28: Tillage and planting techniques for MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	239	99.6	100.0	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

Insect and corn borer control practices

Insecticides applied in MON 810 sorted by their regulatory approval as seed treatment and spray application per country are listed in Appendix A, Table A.2. MON 810 received insecticide treatments mainly through seed coatings. Clothianidin, Imidacloprid and Thiamethoxam are exclusively registered for that purpose. Lambda-Cyhalothrin is the most used active ingredient for spraying. Chlorpyrifos is registered for use as granules and spray.

All farmers were asked to describe their insect control practices in MON 810 compared to conventional maize in 2009. 81.7% (196/240) specified no change in practices, while 18.3% (44/240) used a different program (Table 3.29).

Table 3.29: Use of insect control in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	similar	196	81.7	81.7	81.7
	different	44	18.3	18.3	100.0
Total		240	100.0		

The valid percentage of different insect control practices (18.3%) is greater than 10%. The resulting p-value is greater than the level of significance $\alpha = 0.01$ (Table 3.30). The null hypothesis $f_{different} \geq 0.1$ is therefore not to reject - an effect on the insect control program is indicated.

Table 3.30: Results of the binomial test for different insect control practices in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240			196 (81.7%)	44 (18.3%)	1.0

The difference arises from farmers not controlling corn borers any more with conventional insecticide applications (Table 3.32). This can be anticipated, since MON 810 is specifically designed to control corn borers as *Ostrinia nubilalis* and *Sesamia* spp. Therefore, planting of MON 810 makes insecticide applications for this purpose obsolete. On the other hand, other conventional insecticide applications, targeted at other insect pests (e.g. seed coatings against frit flies) are not changed (Table 3.31). This is because these other pests are not controlled by MON 810 and warrant conventional control practices. This is corroborated by the farmer's descriptions of reduced number of insecticide applications or the abolishment of insecticide treatments against the corn borer in MON 810, since it was not necessary to control the pest.

Table 3.31: Insect control practices compared to conventional maize in the context of the general use of insecticides in 2009

		Insect control practices in MON 810		
		similar	different	Total
Do you usually use insecticides? (section 3.2.5)	Yes	105	44	149
	No	91	0	91
Total		196	44	240

Table 3.32: Corn Borer control practices compared to conventional maize in the context of the general use of insecticides against Corn Borer in 2009

		Corn borer control practices in MON 810		
		similar	different	Total
Do you usually use insecticides against corn borer? (section 3.2.5)	Yes	0	55	55
	No	94	0	94
Total		94	55	149

Weed control practices

The herbicides applied in MON 810 fields are listed in Appendix A, Table A.3. A wide number of herbicides and actives were used. The main actives of herbicides that were cited by the farmers are:

- Acetochlor
- Terbuthylazine
- Nicosulfuron
- Mesotrione
- S-Metolachlor
- Bromoxynil
- Dicamba
- Fluroxypyr
- Dimethenamid-P

- Sulcotrione

These all are well-known products used for weed control in maize. Two farmers (one from Spain and one from Romania) reported a herbicide where actives could not be comprehended.

The farmers were asked to describe their weed control practices in MON 810 in 2009 compared to conventional maize. All farmers used the same weed control in MON 810 compared to conventional maize (Table 3.33).

Table 3.33: Use of weed control in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	similar	240	100.0	100.0	100.0
Total		240	100.0		

Fungal control practices

Fungicides are generally not applied in maize, but all maize usually receives a fungicide seed treatment. In the 2009 survey, as as reported in section 3.2.5, a small number of farmers stated to use fungicides in maize, but they gave no information on what kind of fungicide was used.

Three Romanian Farmers named the fungicides that were used for MON 810: Two farmers used the active Carbedazin (Semnal 500 FS, Carbedazin) and one farmer used the actives Fludioxonil and Metalaxyl-M (Maxim XL). All named fungicides are commonly used for treatment of maize seed.

One farmer said he changed the fungicide program of MON 810 compared to that of conventional maize (Table 3.34). He came from Czech Republic and described, that he used "fungicides only in conventional maize".

Table 3.34: Use of fungicides on MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	similar	239	99.6	99.6	81.7
	different	1	0.4	0.4	100.0
Total		240	100.0		

The valid percentage of different fungal control practices (0.4%) is significantly less than 10% since the resulting P value is less than the level of significance $\alpha = 0.01$ (Table 3.35). Therefore, the null hypothesis $f_{changed} \geq 0.1$ is rejected with a power of 100% and no effect on fungal control program is indicated.

Table 3.35: Result of the binomial test for different fungal control program in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240			239 (99.6%)	1 (0.4%)	< 0.01

Fertilizer application practice

All farmers answered the question regarding the fertilizer application in MON 810. Only one of them used a different program (Table 3.36). He came from Czech Republic and did nor apply fertilizers in MON 810 because he had "no financial resources for fertilizers" and "YG got less N (slurry, manure) because YG balances better with it."

Table 3.36: Fertilizer application practice in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	similar	239	99.6	99.6	81.7
	changed	1	0.4	0.4	100.0
Total		240	100.0		

The valid percentage of changed fertilizer application (0.4%) is significantly less than 10% since the resulting P value is less than the level of significance $\alpha = 0.01$ (Table 3.37). Therefore, the null hypothesis $f_{changed} \geq 0.1$ is rejected with a power of 100% and no effect on fertilizer application program is indicated.

Table 3.37: Result of the binomial test for changed fertilizer application in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240			239 (99.6%)	1 (0.4%)	< 0.01

Irrigation practice

All farmers answered the question regarding the irrigation practice in MON 810, no one changed the practice (Table 3.38).

Table 3.38: Irrigation practice in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	similar	240	100.0	100.0	100.0
Total		240	100.0		

Harvest of MON 810

The farmers were asked if they harvested MON 810 earlier or later than conventional maize or as usual. 7.9% (19/240) of the farmers stated that they harvested MON 810 later compared to conventional maize (Table 3.39, Figure 3.11).

Table 3.39: Harvest of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	earlier	5	2.1	2.1	2.1
	as usual	216	90.0	90.0	92.1
	later	19	7.9	7.9	100.0
Total		240	100.0	100.0	

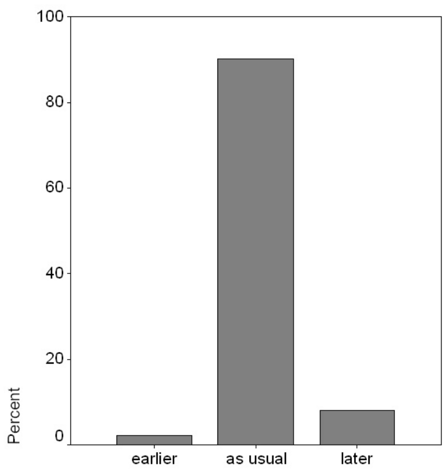

Figure 3.11: Harvest of MON 810 compared to conventional maize in 2009

The valid percentage of earlier harvest (2.1%) and later harvest (7.9%) do not exceed the 10% threshold. But the resulting P value of the latter is greater than the level of significance $\alpha = 0.01$ (Table 3.40) and therefore, the corresponding null hypothesis $f_{later} \geq 0.1$ could not be rejected and indicates an effect on the harvest time of MON 810.

Table 3.40: Results of the binomial tests for different harvesting time of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240	5 (2.1%)	< 0.01	216 (90.0%)	19 (7.9%)	0.167

The full individual feedback of the farmers for different harvesting time is given in Appendix A, Table A.4.

The main reasons given for earlier or later harvest of MON 810, as reflected in Table 3.41 by grouping explanations for earlier/later harvest of MON 810, are increased flexibility (cropping system, logistics, channeling/coexistence) and the status of the plant (development, health, maturity, water content). It has been reported, that MON 810 stays green longer and thus enables a longer maturation than conventional maize. This can be explained by the absence of corn borer damages, as reported by farmers, that generally has a negative influence on plant health, especially during the maturation phase. The absence of this damage can explain the observed differences.

Table 3.41: Reasons for different harvesting time of MON 810 compared to conventional maize in 2009

		Farmers explanations				Total
		Desired flexibility (cropping system, logistics, channeling/ coexistence)	plant development, plant health, stay green effect, maturity, water content	weather	no statement	
Valid	earlier	3	0	2	0	5
	later	7	11	0	1	19
Total		10	11	2	1	24

Assessment of differences in agricultural practices in MON 810 (compared to conventional maize)

Agricultural practices in MON 810 (compared to conventional maize), were not changed with regard to crop rotation, planting time, tillage and planting techniques, weed control, fungal control, fertilizer application and irrigation. Differences exist in some aspects: Insect and corn borer control and harvest of MON 810.

The difference in insect and corn borer control arises from farmers not controlling corn borers any more with conventional insecticide applications, because MON 810 is specifically designed to control corn borers as *Ostrinia nubilalis* and *Sesamia* spp.

Concerning harvest time, a significant number of farmers reported a delayed harvest time for MON 810. Because of the absence of corn borer damages MON 810 stays green longer and thus enables a longer maturation than conventional maize.

3.3.2 Characteristics of MON 810 in the field (compared to conventional maize)

Germination vigor

14.6% (35/239) of the farmers who gave a valid answer on the question on germination vigor assessed MON 810 to be more vigorous, 0.8% (2/239) to be less vigorous at germination (Table 3.42, Figure 3.12).

Table 3.42: Germination of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less vigorous	2	0.8	0.8	0.8
	as usual	202	84.2	84.5	85.4
	more vigorous	35	14.6	14.6	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

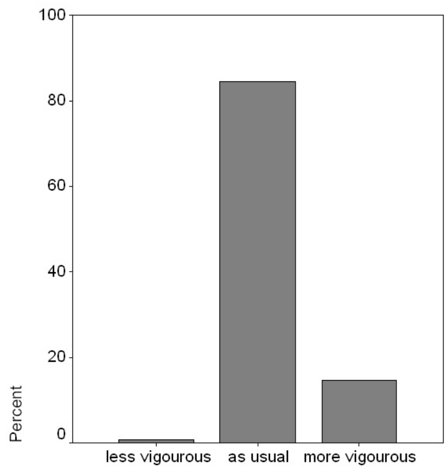

Figure 3.12: Germination of MON 810 compared to conventional maize in 2009

The valid percentages of less vigorous does not exceed the 10% threshold, but the valid percentages for more vigorous does. The P value for more vigorous germination exceeds the level of significance $\alpha = 0.01$, i.e. the null hypothesis $f_{more} \geq 0.1$ could not be rejected (Table 3.43) and an effect on the germination vigor is indicated.

Table 3.43: Results of the binomial tests for different germination vigor of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
240	2 (0.8%)	< 0.01	202 (84.5%)	35 (14.6%)	0.991

Time to emergence

5.4% (13/239) of the farmers assessed the time to emergence to be accelerated for MON 810, while 0.8% (2/239) indicated the time to emergence to be delayed (Table 3.44, Figure 3.13).

Table 3.44: Time to emergence of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	13	5.4	5.4	5.4
	as usual	224	93.3	93.7	99.2
	delayed	2	0.8	0.8	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

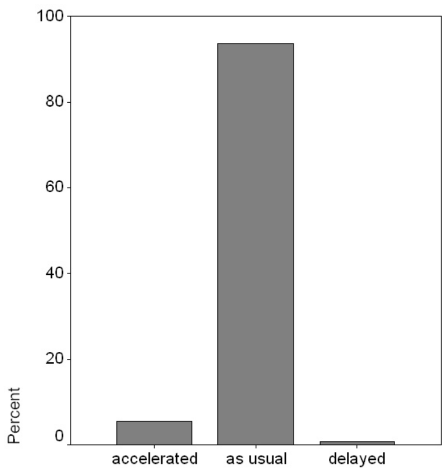

Figure 3.13: Time to emergence of MON 810 compared to conventional maize in 2009

Valid percentages for both accelerated and delayed time to emergence do not exceed the 10% threshold. The resulting P value are less than the level of significance $\alpha = 0.01$ for both null hypotheses (Table 3.45), so they could be rejected with a power of 57.3% for $f_{accelerated} \geq 0.1$ and 100% $f_{delayed} \geq 0.1$ and no effect is indicated.

Table 3.45: Results of the binomial tests for different time to emergence of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	13 (5.4%)	< 0.01	224 (93.3%)	2 (0.8%)	< 0.01

Time to male flowering

Time to male flowering was assessed to be as usual in 95.8% (230/239) of the valid cases (Table 3.46, Figure 3.14).

Table 3.46: Time to male flowering of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	5	2.1	2.1	2.1
	as usual	230	95.8	96.2	98.3
	delayed	4	1.7	1.7	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

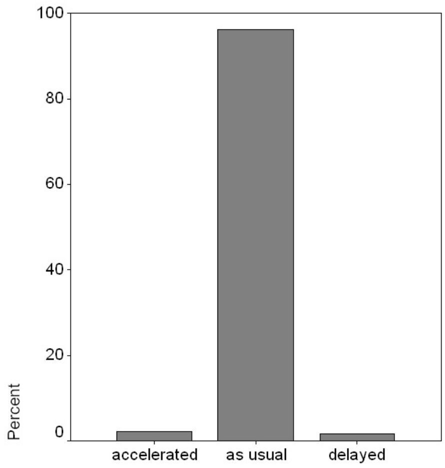

Figure 3.14: Time to male flowering of MON 810 compared to conventional maize in 2009

Neither the valid percentage of accelerated time to male flowering (2.1%), nor the valid percentage of delayed time to male flowering (1.7%) exceed the 10% threshold and the resulting P values are less than the level of significance $\alpha = 0.01$ (Table 3.47). The null hypotheses $f_{accelerated} \geq 0.1$ and $f_{delayed} \geq 0.1$ could be rejected with a power of 100%.

Table 3.47: Results of the binomial tests for different time to male flowering of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	5 (2.1%)	< 0.01	230 (96.2%)	4 (1.7%)	< 0.01

Plant growth and development

Plant growth and development was as usual in 92.1% (220/239) of the valid cases (Table 3.48, Figure 3.15).

Table 3.48: Plant growth and development of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	14	5.8	5.9	5.9
	as usual	220	91.7	92.1	97.9
	delayed	5	2.1	2.1	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

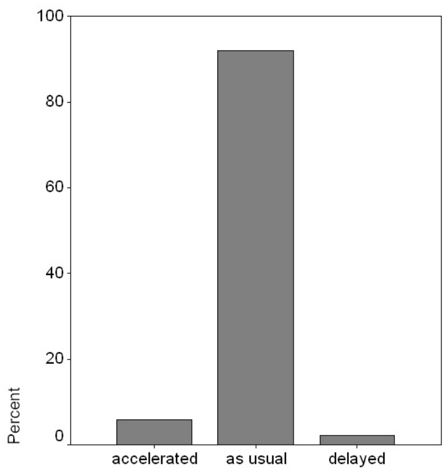

Figure 3.15: Plant growth and development of MON 810 compared to conventional maize in 2009

Both valid percentages for accelerated (5.8%) and delayed (2.1%) plant growth and development are less than the 10% threshold. The resulting P value is less than the level of significance $\alpha = 0.01$ (Table 3.49) for $f_{delayed}$, but greater than $\alpha = 0.01$ for $f_{accelerated}$. Therefore the null hypothesis $f_{delayed} \geq 0.1$ is rejected with a power of 99.9%, where the null hypothesis $f_{accelerated} \geq 0.1$ can not be rejected. The lower 99% confidence interval limit is 0.019, the upper limit is 0.098 and is below the threshold of 10%.

Table 3.49: Results of the binomial tests for different plant growth and development of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	14 (5.8%)	0.016	220 (91.7%)	5 (2.1%)	< 0.01

Incidence of stalk/root lodging

Incidence of stalk/root lodging was assessed to be less frequent in MON 810 compared to conventional maize in 31.9% (76/238) of the valid cases (Table 3.50, Figure 3.16).

Table 3.50: Incidence of stalk/root lodging of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less often	76	31.7	31.9	31.9
	as usual	162	67.5	68.1	100.0
	more often	0	0.0	0.0	100.0
	Total	238	99.2	100.0	
Missing	no statement	2	0.8		
Total		240	100.0		

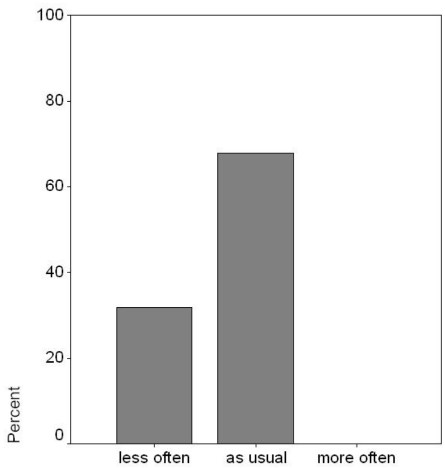

Figure 3.16: Incidence of stalk/root lodging of MON 810 compared to conventional maize in 2009

The valid percentage of lower incidence of stalk/root lodging (31.7%) does exceed the 10% threshold. The resulting P value is greater than the level of significance $\alpha = 0.01$ (Table 3.51) and therefore, the corresponding null hypothesis $f_{less} \geq 0.1$ could not be rejected and clearly indicates an effect on the incidence of stalk/root lodging of MON 810.

Table 3.51: Results of the binomial tests for different incidence of stalk/root lodging of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
238	76 (31.7%)	1.0	162 (67.5%)	0 (0.0%)	< 0.01

Time to maturity

14.6% (35/239) of the farmers who gave a valid answer, assessed the time to maturity to be delayed for MON 810, while 2.9% (7/239) assed it to be accelerated (Table 3.52, Figure 3.17).

Table 3.52: Time to maturity of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	7	2.9	2.9	2.9
	as usual	197	82.1	82.4	85.4
	delayed	35	14.6	14.6	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

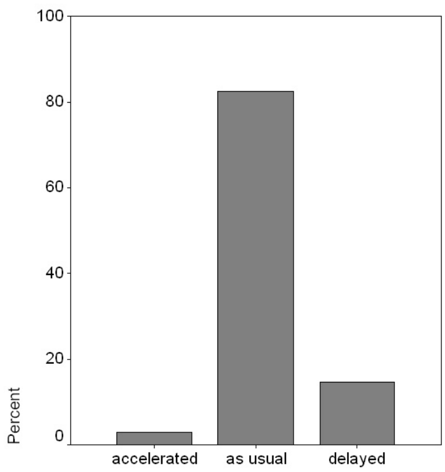

Figure 3.17: Time to maturity of MON 810 compared to conventional maize in 2009

The valid percentage of accelerated time to maturity (2.9%) does not exceed the 10% threshold, but the valid percentage of delayed time to maturity (14.6%) does. The resulting P value of the latter is greater than level of significance $\alpha = 0.01$ (Table 3.53) and therefore, the corresponding null hypothesis $f_{delayed} \geq 0.1$ could not be rejected and clearly indicates an effect on the time to maturity of MON 810.

Table 3.53: Results of the binomial tests for different time to maturity of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
238	7 (2.9%)	< 0.01	197 (82.1%)	35 (14.6%)	0.991

Yield

Yield was higher in 56.9% (136/239) of the valid cases (Table 3.54, Figure 3.18).

Table 3.54: Yield of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	lower yield	4	1.7	1.7	1.7
	as usual	99	41.3	41.4	43.1
	higher yield	136	56.7	56.9	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

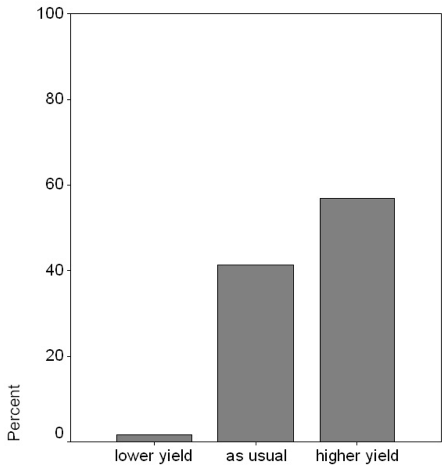

Figure 3.18: Yield of MON 810 compared to conventional maize in 2009

The valid percentage of lower yield (1.7%) does not exceed the 10% threshold, but the valid percentage of higher yield (56.9%) does. The resulting P value of the latter is greater the than level of significance $\alpha = 0.01$ (Table 3.55) and therefore, the corresponding null hypothesis $f_{higher} \geq 0.1$ could not be rejected and clearly indicates an effect on yield of MON 810.

Table 3.55: Results of the binomial tests for different yield of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	4 (1.7%)	< 0.01	99 (41.4%)	136 (56.9%)	1.0

Occurrence of volunteers

The occurrence of volunteers was assessed to be less frequent for MON 810 than for conventional maize in 8.8% (21/195) of the valid cases (Table 3.56, Figure 3.19).

Table 3.56: Occurrence of MON 810 volunteers compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less often	21	8.8	10.8	10.8
	as usual	174	72.5	89.2	100.0
	Total	195	81.3	100.0	
Missing	no statement	45	18.8		
Total		240	100.0		

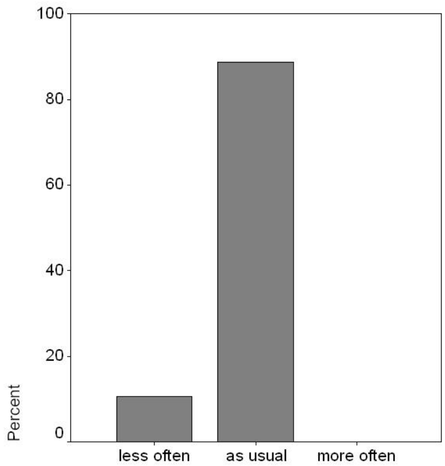

Figure 3.19: Occurrence of MON 810 volunteers compared to conventional maize in 2009

The valid percentage of lower occurrence of volunteers does not exceed the 10% threshold. But the resulting P value of the lower occurrence of volunteers is greater than the level of significance $\alpha = 0.01$ (Table 3.57) and therefore, the corresponding null hypothesis $f_{less} \geq 0.1$ could not be rejected and indicates an effect on occurrence of MON 810 volunteers.

Table 3.57: Results of the binomial tests for different occurrence of MON 810 volunteers compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
195	21 (10.8%)	0.692	174 (89.2%)	0 (0.0%)	< 0.01

Assessment of differences in the characteristics of MON 810 in the field (compared to conventional maize)

A summary of these results for the characteristics of MON 810 in the field compared to conventional maize shows:

- a more vigorous germination,
- an unchanged time to emergence,
- an unchanged time to male flowering,
- a slightly accelerated plant growth and development,
- a lower incidence of stalk/root lodging,
- a delayed time to maturity,
- a higher yield and
- a lower occurrence of MON 810 volunteers.

Some of the differences can be explained by the absence of corn borer damage, that negatively affects plant growth, maturation and especially yield.
The difference in the incidence of stalk/root lodging can also be explained this way. Therefore differences in these parameters are anticipated and only underline the effectiveness of corn borer control.
The longer time to maturity might also be an effect of corn borer control: in the presence of pests, plants need to reach maturity faster. In the absence of pest pressure, plants can maximize the output of biomass and have a longer period of seed set and ripening. This could explain the longer time to maturity reported for MON 810 by 14.6% of farmers. The low percentage indicates that this phenomenon is restricted to areas of pest pressure. If this were a more general effect, the valid percentage of farmers reporting on this would be much higher.
The difference in occurrence of volunteers in MON 810 might be explained by less lodging because of the very good insect control resulting to a better and more effective harvest. Volunteers grow from seed kernels lost before and during harvest, so the simplest and most straight explanation for the reported difference is that less cobs/kernels are lost before and during harvest, because of less corn borer damage resulting better maturation of the plants and less lodging. Less lodging facilitates a more efficient harvest by the combines.

Individual explanations for these observations are given in Appendix A, Table A.5.

All additional observations of the farmers during plant growth are listed in Appendix A, Table A.6.

3.3.3 Disease susceptibility in MON 810 fields (compared to conventional maize)

Farmers assessed MON 810 to be less susceptible to diseases, 29.3% (70/239) (Table 3.58, Figure 3.20).

Table 3.58: Disease susceptibility in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less susceptible	70	29.2	29.3	29.3
	as usual	168	70.0	70.3	99.6
	more susceptible	1	0.4	0.4	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

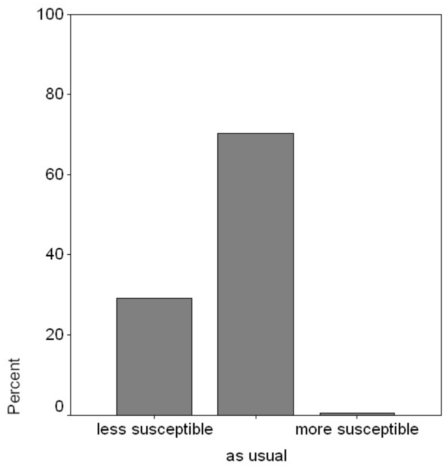

Figure 3.20: Disease susceptibility in MON 810 compared to conventional maize in 2009

The valid percentage of higher disease susceptibility (0.4%) does not exceed the 10% threshold, but the valid percentage of lower disease susceptibility (29.3%) does. The resulting P value of the latter is greater than the level of significance $\alpha = 0.01$ (Table 3.59) and therefore, the corresponding null hypothesis $f_{less} \geq 0.1$ could not be rejected and clearly indicates an effect on disease susceptibility.

Table 3.59: Results of the binomial tests for different disease susceptibility of MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	70 (29.3%)	1.0	168 (70.3%)	1 (0.4%)	< 0.01

The 71 farmers that answered different from "as usual" were asked to specify the difference in disease susceptibility by listing the diseases with an explanation. Table 3.60 lists the reported diseases with an assessment of the disease susceptibility of MON 810, compared to conventional maize. This list shows that the lower disease susceptibility was predominantly attributed to a lower susceptibility to *Fusarium* ssp. (23.8%, 57/239); to a lesser extent, a lower susceptibility to *Ustilago maydis* (16.7%, 40/239), *Helminthosporium* ssp. (6.7%, 16/239), as well as some other fungal and viral diseases was also mentioned.

Table 3.60: Specification of differences in disease susceptibility in MON 810 compared to conventional maize in 2009

Group	Species	Different	More	Less
Fungus	*Fusarium* ssp.	57	-	57
	Ustilago maydis	40	-	40
	Helminthosporium ssp.	16	-	16
	Rhizoctonia solani	9	-	9
	Puccinia sorghi	7	-	7
	Cephalosporium spp.	6	-	6
	Sphacelotheca reiliana	1	-	1
	Hongos generos Fusarium	1	-	1
	MDMV and *MRDV*	1	1	-

Assessment differences in disease susceptibility in MON 810 fields (compared to conventional maize)

The differences were indicated to have been observed for a number of different fungal species, most notably *Fusarium* spp., *Ustilago maydis* and *Helminthosporium* spp.
This observation is not surprising, since it has been well established that feeding holes and tunnels of the corn borer serve as entry points for secondary fungal infections, especially of the *Fusarium* spp.. *Ustilago maydis* also has a high incidence especially with stressed plants (water stress, mechanical wounding, insect feeding damage), so that any reduction of a stress factor would immediately result in a lower incidence of disease. Therefore, the observed differences are easily explained by corn borer control and confirm previous observations of lower fungal infections in MON 810 reported in the scientific literature (Munkvold et al., 1999 [11]; Bakan et al., 2002 [1]; Hammond et al., 2003 [9]; Wu, 2006 [37]). The farmers' testimony (Appendix A, Table A.7) thus corroborate previous findings.

3.3.4 Insect pest control in MON 810 fields (compared to conventional maize)

The insect pest control on *Ostrinia nubilalis* (European corn borer) was assessed to be very good or good in 99.6% (238/239) of the valid cases (Table 3.61, Figure 3.21).

Table 3.61: Insect pest control of *Ostrinia nubilalis* in MON 810 in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	weak	1	0.4	0.4	0.4
	good	14	5.8	5.9	6.3
	very good	224	93.3	93.7	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

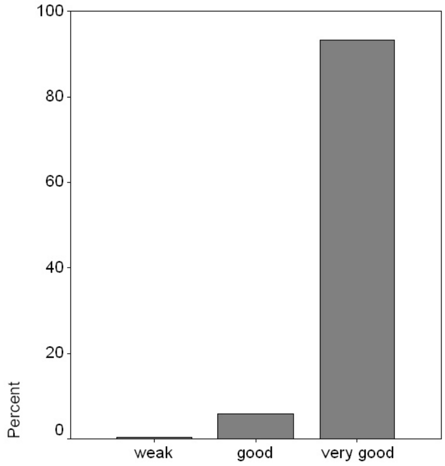

Figure 3.21: Insect pest control of *Ostrinia nubilalis* in MON 810 in 2009

This high percentage clearly indicates an effect (Table 3.62). The null hypothesis $f_{very\ good} \leq 0.1$ cannot be rejected. This effect is expected because MON 810 is genetically modified to be protected against this pest.

Table 3.62: Results of the binomial tests for Insect pest control of *Ostrinia nubilalis* in MON 810 in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	1 (0.04%)	< 0.01	14 (5.9%)	224 (93.7%)	1.0

Nearly all of the farmers who gave a valid answer (99.3%) attested a very good control of *Sesamia* spp. (Table 3.63, Figure 3.22). The high percentage of missing values in efficacy of MON 810 against *Sesamia spp.* (Pink Borer) resulted from the fact that this question was not asked in Czech Republic and Slovakia, since the pest is just not present in this countries.

Table 3.63: Insect pest control of *Sesamia* spp. in MON 810 in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	good	1	0.4	0.7	0.7
	very good	141	58.8	99.3	100.0
	Total	142	59.2	100.0	
Missing	no statement	98	40.8		
Total		240	100.0		

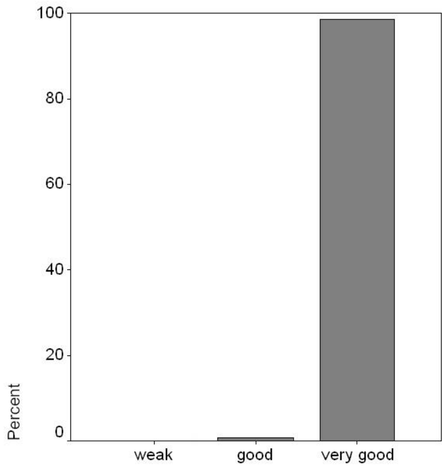

Figure 3.22: Insect pest control of *Sesamia* spp. in MON 810 in 2009

This high percentage clearly indicates an effect (Table 3.64). The null hypothesis $f_{very\ good} \geq 0.1$ can not be rejected. This effect is expected because MON 810 is genetically modified to be protected against this pest.

Table 3.64: Results of the binomial tests for Insect pest control of *Sesamia* spp. in MON 810 in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
144	0 (0.0%)	< 0.01	1 (0.7%)	141 (99.3%)	1.0

Assessment of insect pest control in MON 810 fields (compared to conventional maize)

The results show that both pests (*Ostrinia nubilalis* and *Sesamia* spp.) are effectively controlled by MON 810. Additional comments on insect pest control are listed in Appendix A, Table A.8.

3.3.5 Other pests in MON 810 fields (compared to conventional maize)

Farmers assessed MON 810 to be less susceptible to pests in 17.1% (41/238) of the cases (Table 3.65, Figure 3.23).

Table 3.65: Pest susceptibility of MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less susceptible	41	17.1	17.2	17.2
	as usual	194	80.8	81.5	98.7
	more susceptible	3	1.3	1.3	100.0
	Total	238	99.2	100.0	
Missing	no statement	2	0.8		
Total		240	100.0		

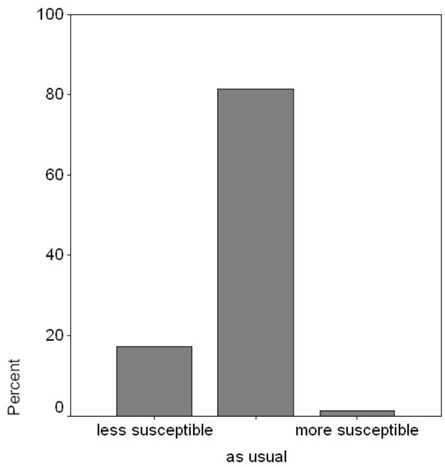

Figure 3.23: Pest susceptibility of MON 810 compared to conventional maize in 2009

The valid percentage of higher pest susceptibility (1.3%) does not exceed the 10% threshold but the valid percentage of lower pest susceptibility (17.2%) does. The resulting P value of lower pest susceptibility is greater than the level of significance $\alpha = 0.01$ (Table 3.66) and therefore, the corresponding null hypothesis $f_{less} \geq 0.1$ could not be rejected and indicates an effect on pest susceptibility.

Table 3.66: Results of the binomial tests for different pest susceptibility in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
238	41 (17.2%)	1.0	194 (81.5%)	3 (1.3%)	< 0.01

The 44 farmers that answered different from as usual were asked to specify the difference in pest susceptibility by listing the pests with an explanation. Table 3.67 lists the reported pests with an assessment of the pest susceptibility of MON 810, compared to conventional maize. This list shows that the lower pest susceptibility was predominantly attributed to a lower susceptibility to pests of the order Lepidoptera (23.9%, 57/238).

Table 3.67: Specification of differences in pest susceptibility in MON 810 compared to conventional maize in 2009

Order	Name	different	less	more
Lepidoptera	Agrotis spp.	24	24	-
	Spodoptera spp.	20	20	-
	Heliotis	12	12	-
	Mythimna spp.	1	1	-
Coleoptera	Agriotes spp.	2	-	2
	Diabrotica virgifera	1	-	1
Arachnida	Tetranychus spp.	2	2	-
Hemiptera	Aphids	1	-	1
Diptera	Mosquitos	1	1	-

If the answers concerning Lepidopteran pests are removed the pest susceptibility is $As\ ususal$ in 95.1% of the left valid cases (Table 3.68, Figure 3.24).

Table 3.68: Pest susceptibility of MON 810 compared to conventional maize in 2009 when Lepidoptera is removed

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less susceptible	7	3.4	3.4	3.4
	as usual	194	94.2	95.1	98.5
	more susceptible	3	1.5	1.5	100.0
	Total	204	99.0	100.0	
Missing	no statement	2	1.0		
Total		206	100.0		

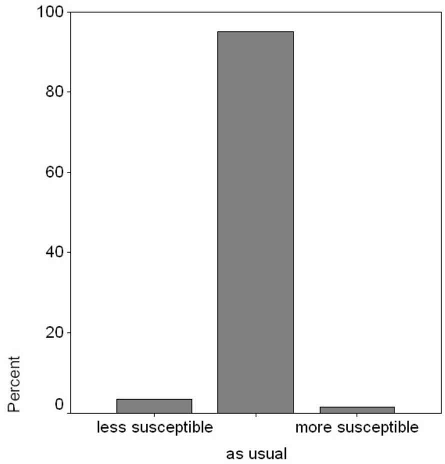

Figure 3.24: Pest susceptibility of MON 810 compared to conventional maize in 2009 when Lepidoptera is removed

The data on susceptibility to other pests than Lepidoptera were analysed separately for each order of pests. As shown in Table 3.69 there is no effect on susceptibility to every single order of pests indicated. Here the percentages of lower or higher susceptibility do not exceed the threshold of 10% and none of the resulting P values is greater than the level of significance $\alpha = 0.01$.

Table 3.69: Results of the binomial tests for single order susceptibilities of MON 810 compared to conventional maize in 2009 when Lepidoptera is removed

	N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
Diptera	238	1 (0.4%)	< 0.01	237 (99.5%)	0 (0.0%)	< 0.01
Coleoptera	238	0 (0.0%)	< 0.01	235 (98.7%)	3 (1.3%)	< 0.01
Arachnida	238	2 (0.8%)	< 0.01	236 (99.2%)	0 (0.0%)	< 0.01
Hemiptera	238	0 (0.0%)	< 0.01	237 (99.5%)	1 (0.4%)	< 0.01

Assessment differences in susceptibility to other pests in MON 810 fields (compared to conventional maize)

The data show that the susceptibility to other pests in MON 810 is unchanged, except for those belonging to the order Lepidoptera. This is not surprising, given the plethora of scientific studies on laboratory and field experiments showing that the Cry protein expressed in MON 810 does not have a negative effect on any insects other than those belonging to the order for which they specifically have toxic properties (Marvier et al., 2007 [10]; Wolfenbarger et al., 2008 [36]). The monitoring data thus corroborate the conclusions drawn during the environmental risk assessment and ongoing research. As reflected by the farmers (Appendix A, Table A.9), pest incidence of other pests was higher, because no conventional insecticides were applied and thus other pests were not controlled (in comparison to conventional maize, where insecticides were applied).

3.3.6 Weed pressure in MON 810 fields (compared to conventional maize)

Weed pressure, as reported by the farmers in MON 810 fields differ in 5 of 239 valid cases compared to conventional fields. They (2.1%) stated that there were less weeds in MON 810 fields. 97.9% (234/239) of all farmers stated weed pressure to be as usual in MON 810 fields (Table 3.70, Figure 3.25).

Table 3.70: Weed pressure in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less weeds	5	2.1	2.1	2.1
	as usual	234	97.5	97.9	100.0
	Total	239	99.6	100.0	
Missing	no statement	1	0.4		
Total		240	100.0		

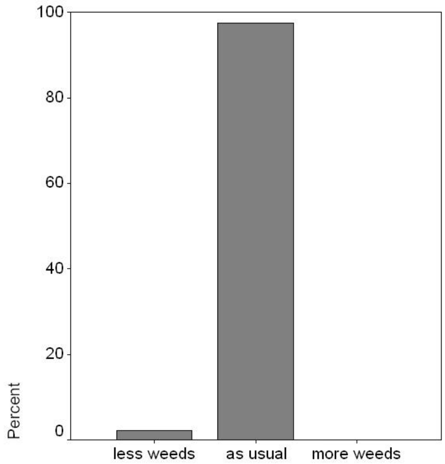

Figure 3.25: Weed pressure in MON 810 compared to conventional maize in 2009

Based on Table 3.71, both null hypotheses $f_{less} \geq 0.1$ and $f_{more} \geq 0.1$ are rejected. No effect is indicated and, as the additional comments of the farmers on weed pressure (Table A.10) show as well, there is no reasonable hypothesis to suspect otherwise in the first place.

Table 3.71: Results of the binomial tests for different weed pressure in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
239	5 (2.1%)	< 0.01	234 (97.9%)	0 (0.0%)	< 0.01

Assessment differences in weed pressure in MON 810 fields (compared to conventional maize)

It is not surprising that the weed pressure in MON 810 fields have been described to be similar to that in conventional maize. According to 3.3.1 no changes in weed control practice in MON 810 fields compared to conventional maize were reported.

3.3.7 Occurrence of wildlife in MON 810 fields (compared to conventional maize)

Occurrence of non target insects

Farmers assessed the occurrence of non target insects in MON 810 fields to be as usual in 98.3% (227/231) of the valid cases. 0.9% (2/231) observed more non target insects and 0.9% (2/231) observed less non target insects in their MON 810 field (Table 3.72, Figure 3.26).

Table 3.72: Occurrence of non target insects in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less	2	0.8	0.9	0.9
	as usual	227	94.6	98.3	99.1
	more	2	0.8	0.9	100.0
	Total	231	96.3	100.0	
Missing	do not know	9	3.8		
Total		240	100.0		

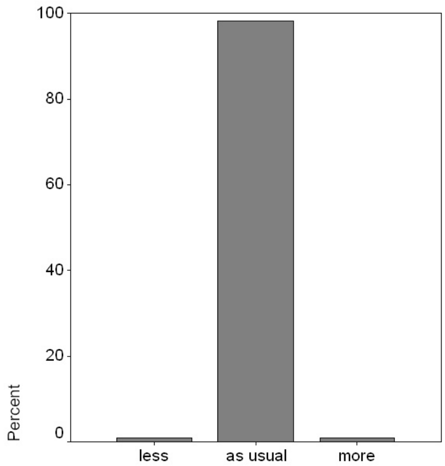

Figure 3.26: Occurrence of non target insects in MON 810 compared to conventional maize in 2009

Valid percentages for both more and less non target insects do not exceed the 10% threshold. The resulting P values are less than the level of significance $\alpha = 0.01$ (Table 3.73). Therefore, the null hypotheses $f_{more} \geq 0.1$ and $f_{less} \geq 0.1$ are rejected and no effect on occurrence of non target insects is indicated.

Table 3.73: Results of the binomial tests for different occurrence of non target insects in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
231	2 (0.9%)	< 0.01	227 (98.3%)	2 (0.9%)	< 0.01

Occurrence of birds

Farmers assessed the occurrence of birds in MON 810 fields to be as usual in 99.6% (230/231) of the valid cases. One farmer (0.4%) observed less birds in his MON 810 field (Table 3.74, Figure 3.27).

Table 3.74: Occurrence of birds in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less	1	0.4	0.4	0.4
	as usual	230	95.8	99.6	100.0
	Total	231	96.3	100.0	
Missing	do not know	9	3.8		
Total		240	100.0		

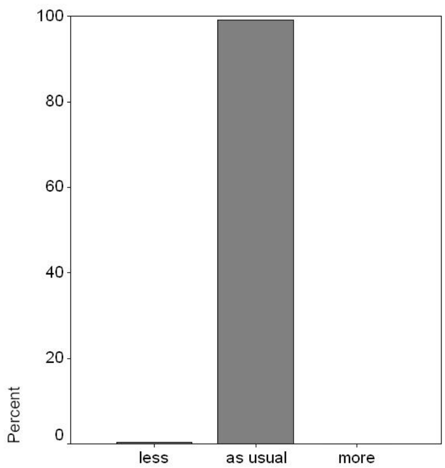

Figure 3.27: Occurrence of birds in MON 810 compared to conventional maize in 2009

Valid percentages for both more and less birds do not exceed the 10% threshold. The resulting P values are less than the level of significance $\alpha = 0.01$ (Table 3.75). Therefore, the null hypotheses $f_{more} \geq 0.1$ and $f_{less} \geq 0.1$ are rejected and no effect on occurrence of birds is indicated.

Table 3.75: Results of the binomial tests for different occurrence of birds in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
231	1 (0.4%)	< 0.01	230 (99.6%)	0 (0.0%)	< 0.01

Occurrence of mammals

Farmers assessed the occurrence of mammals in MON 810 fields to be as usual in 97.8% (227/232) of the valid cases. 0.9% (2/232) observed less mammals and 1.3% (3/232) observed more mammals in their MON 810 field (Table 3.76, Figure 3.28).

Table 3.76: Occurrence of mammals in MON 810 compared to conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less	2	0.8	0.9	0.9
	as usual	227	94.6	97.8	98.7
	more	3	1.3	1.3	100.0
	Total	232	96.7	100.0	
Missing	do not know	8	3.3		
Total		240	100.0		

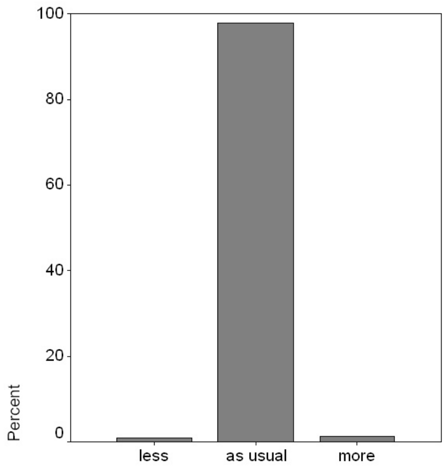

Figure 3.28: Occurrence of mammals in MON 810 compared to conventional maize in 2009

Valid percentages for both more and less birds do not exceed the 10% threshold. The resulting P values are less than the level of significance $\alpha = 0.01$ (Table 3.77). Therefore, the null hypotheses $f_{more} \geq 0.1$ and $f_{less} \geq 0.1$ are rejected and no effect on occurrence of mammals is indicated.

Table 3.77: Results of the binomial tests for different occurrence of mammals in MON 810 compared to conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
232	2 (0.9%)	< 0.01	227 (97.8%)	3 (1.3%)	< 0.01

Assessment of differences in occurrence of wildlife in MON 810 fields (compared to conventional maize)

The occurrence of wildlife in MON 810 is reported to be unchanged for non target insects, birds and mammals.
This results again underlines the specificity of the expressed Cry protein towards Lepidoptera, exhibiting no effect on other wildlife, especially non target insects. MON 810 thus is substantially equivalent to conventional maize and hosts the same wildlife. Birds are dependent on insects and wild plants in the agricultural landscape, and are a good indicator for larger scale level effects. The same holds true for mammals, although their occurrence in maize is limited. Studies have shown that no impact on mammals caused by the consumption of MON 810 is to be expected (Shimada et al., 2003 [23], 2006a [24], 2006b [25]; Stumpff et al., 2007 [32]; Bondzio et al., 2008 [5]).

Specifications on the occurrence of wildlife are listed in Attachment 2, Table A.11 and A.12.

3.3.8 Feed use of MON 810 (if previous year experience with MON 810)

29.0% (69/238) of the asked farmers used the harvest of MON 810 to feed their animals (Table 3.78). These data reflect only the range of feeding. We assume that only farmers that cultivate silage maize feed them to their livestock. That could be the reason why only 29.0% of the surveyed farmers fed MON 810, but there are no strong data supporting this assumption.

Table 3.78: Use of MON 810 harvest for animal feed in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	69	28.8	29.0	29.0
	no	169	70.4	71.0	100.0
	Total	238	99.2	100.0	
Missing	no statement	2	0.8		
Total		240	100.0		

8.9% (5/56) of the farmers who gave a valid answer to the question on the performance of the animals fed MON 810 observed a different performance of them compared to the animals fed conventional maize (Table 3.79, Figure 3.29).

Table 3.79: Performance of the animals fed MON 810 compared to the animals fed conventional maize in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	51	73.9	91.1	91.1
	different	5	7.2	8.9	100.0
	Total	56	81.2	100.0	
Missing	do not know	13	18.8		
Total		69	100.0		

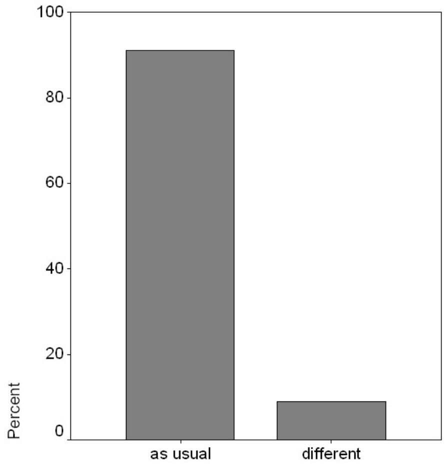

Figure 3.29: Performance of the animals fed MON 810 compared to the animals fed conventional maize in 2009

The valid percentage for different performance of the animals fed MON 810 does not exceed the 10% threshold, but the P value is greater than the level of significance $\alpha = 0.01$ (Table 3.80). The null hypothesis for $f_{less} \geq 0.1$ cannot be rejected, so an effect on performance of animals fed MON 810 is indicated. The lower 99% confidence interval limit is 0.00, the upper limit is 0.19.

Table 3.80: Results of the binomial test for different performance of the animals fed MON 810 compared to the animals fed conventional maize in 2009

N valid	$Minus$	P for $p_0 = 0.1$	$As\ usual$	$Plus$	P for $p_0 = 0.1$
56			51 (97.1%)	5 (8.9%)	0.507

Assessment of differences in feed use of MON 810 (if previous year experience with MON 810)

Four farmers from Czech Republic (Appendix A, Table A.13) reported a better health of their animals when fed MON 810, because of a lower incidence of mycotoxins in the feed (due to lower ECB feeding damage on the plant). Mycotoxin contaminated animal feed leads to food refusal, lower food conversion, increased disease in animals, lower weight gain and overall diminished health of animals. A reduction of the incidence and level of mycotoxins in MON 810 is thus beneficial to the animals and led to a difference in animal performance.

3.3.9 Any additional remarks or observations

Additional remarks or observations are listed in Attachment 2, Table A.14. No unexpected adverse effects are reported.

3.4 Part 4: Implementation of *Bt*-maize specific measures

3.4.1 Information on good agricultural practices on MON 810

99.6% (239/240) of the farmers reported having been informed about the good agricultural practices applicable to MON 810 (Table 3.81).

Table 3.81: Information on good agricultural practices in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	239	99.6	99.6	99.6
	no	1	0.4	0.4	100.0
Total		240	100.0	100.0	

97.5% (233/239) of the farmers considered the training sessions to be either useful or very useful (Table 3.82). This information indicates that the great majority of the farmers had been exposed to a valuable training concerning MON 810.

Table 3.82: Evaluation of training sessions in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	very useful	88	36.7	36.8	36.8
	useful	145	60.4	60.7	97.5
	not useful	6	2.5	2.5	100.0
	Total	239	99.6	100.0	
Missing	No statement	1	0.4		
Total		240	100.0		

3.4.2 Seed

The question "was the bag labeled with accompanying documentation indicating that the product is genetically modified maize MON 810" was answered with “yes” in all cases. This indicated that the bags were labeled appropriately and that the label and the accompanying documentation were clear to the farmers.

The great majority of the farmers (95.8% percent of those that answered) reported that they are following the label recommendations on the seed bags (Table 3.83). 10 farmers (4.2%) admitted that they did not follow the label recommendation, in most of the case their deviation was the planting of a refuge.

Deviations from the label recommendations are listed in Appendix A, Table A.15.

Table 3.83: Compliance with label recommendations in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	230	95.8	95.8	95.8
	no	10	4.2	4.2	100.0
Total		240	100.0	100	

3.4.3 Prevention of insect resistance

While 3.3% (8/240) of the farmers who gave a valid answer did not plant a refuge because they had less than 5 ha of maize in the farm (the Insect Resistance Management Plan states that no refuge is required if less than 5 hectares are planted), 87.1% (209/240) did plant a refuge (Table 3.84). So 90.4% (217/240) of the farmers did follow the label recommendations while 95.8% (230/240) of all farmers reported having been compliant with them. 9.6% (23/240) of the farmers who gave a valid answer reported that they did not plant a refuge.

Table 3.84: Plant refuge in 2009

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	209	87.1	87.1	87.1
	no, because the surface of *Bt*-maize is < 5 ha	8	3.3	3.3	90.4
	no	23	9.6	9.6	100.0
Total		240	100.0	100	

In Spain the compliance in 2009, among the farmers who were required to plant a refuge (i.e. farm growing more than 5 ha of maize), 91.4% of them (85/93) did it (Table 3.85).

In Portugal, the farmers that indicated they did not plant a refuge, indicated that they were part of a production area. The organization in production areas allows collective compliance with refuge requirements.

Table 3.85: Refuge implementation per country in 2009

	Country	Yes	No, because the surface of *Bt*-maize is < 5 ha	No	Total
Valid	Spain	85	7	8	100
	Portugal	31	-	11[1]	42
	Czech Republic	46	-	3	49
	Slovakia	6	-	-	6
	Romania	38	1	1	40
	Poland	3	-	-	3
Total		209	8	23	240

[1] All these farmers were part of a production area and collectively compliant with refuge requirements.

The level of compliance in Spain is probably linked to the history of the first *Bt*-maize introduction in 1998. Since the introduction of MON 810 in Spain in 2003, an extensive communication has been implemented and resulted in higher compliance throughout the years. The communication on refuge implementation had started from the very beginning of MON 810 commercialization in all the other countries, explaining a higher compliance there.

Four farmers (three Czech and one Romanian) did not plant a refuge because of misunderstanding of the refuge principle. This was followed by the interviewers during the interviews (in Czech Republic) or was searched by query (in Romania).

Reasons for not planting a refuge are listed in Appendix A, Table A.16.

Chapter 4

Conclusions

The analysis of 240 questionnaires from a survey of farmers cultivating MON 810 in 2009 in six European countries did not reveal any unexpected adverse effects that could be associated with the genetic modification in MON 810. The size of the sample was proven large enough to significantly reject the hypotheses on adverse effects under the specific 2009 conditions.

The statistically significant effects reported in Part 3 were neither unexpected nor adverse. The corresponding observations mostly correlate to the intended insect protection trait present in MON 810.

This set of data is entered in a database, and complements data collected from the 2006 to 2008 growing seasons. Currently the database contains data of 1079 valid questionnaires. The survey will be conducted year after year with new entries generated in following season's questionnaires to provide a long term analysis of the effects of cultivation of MON 810 in Europe.

As shown in Table 4.1 the frequency patterns of farmers' answers in 2009 are similar to those of the previous years. In general the same effects have been observed.

After four years of farmers surveys no unexpected adverse effects are indicated. Compared to the cultivating practices in conventional maize farmers use nearly the same practices for cultivating MON 810. Because there are no damages of corn borers on the plant, it is healthier overall and therefore it gives more yield.

The data of the influencing factors differ between the years, but the data of the monitoring characters show nearly the same effects every year.

Table 4.1: Overview on the results of the descriptive analysis of the monitoring characters in 2006 - 2009

	Minus[1]				*Plus*[1]			
Monitoring characters[1]	2006	2007	2008	2009	2006	2007	2008	2009
Crop rotation[2]								0.8%
Time of planting	1.6%	3.4%	2.7%	2.9%	5.9%	3.8%	2.7%	1.3%
Tillage and planting technique					0.0%	0.7%	0.0%	0.4%
Insect control practices					48.0%	11.9%	22.2%	18.3%
Weed control practices					0.4%	0.3%	0.3%	0.0%
Fungal control practices					0.0%	1.1%	0.3%	0.4%
Maize Borer control practice[3]							9.8%	0.0%
Fertilizer application					0.8%	0.3%	0.0%	0.4%
Irrigation Practices					1.6%	0.0%	0.0%	0.0%
Time of harvest	2.4%	3.8%	3.4%	2.1%	24.1%	18.6%	13.8%	7.9%
Germination vigor	6.0%	4.1%	1.7%	0.8%	8.0%	6.9%	11.4%	14.6%
Time to emergence	6.9%	3.1%	6.4%	5.4%	5.7%	3.8%	2.0%	0.8%
Time to male flowering	0.4%	1.7%	4.7%	2.1%	1.6%	7.7%	3.7%	1.7%
Plant growth and development	6.5%	6.9%	9.8%	5.9%	1.6%	4.8%	2.7%	2.1%
Incidence of stalk / root lodging	58.9%	36.2%	38.6%	31.9%	1.6%	0.3%	0.3%	0.0%
Time to maturity	2.0%	4.8%	4.3%	2.9%	30.9%	25.9%	24.0%	14.6%
Yield	2.4%	3.9%	4.4%	1.7%	68.7%	44.8%	52.7%	56.9%
Occurrence of volunteers	33.9%	8.4%	11.1%	10.8%	0.0%	1.7%	0.0%	0.0%
Disease susceptibility	36.1%	21.7%	34.7%	29.2%	2.0%	1.0%	0.7%	0.4%
Insect pest control (ECB)	0.4%	0.0%	0.4%	0.4%	96.4%	86.3%	86.3%	93.7%
Insect pest control (PB)	0.0%	0.0%	0.0%	0.0%	91.0%	83.9%	85.4%	99.3%
Pest susceptibility	11.1%	5.9%	18.5%	17.2%	1.2%	1.4%	0.7%	1.3%
Weed pressure	0.4%	2.1%	1.7%	2.1%	0.0%	0.3%	0.3%	0.0%
Occurrence of wildlife[4]	2.9%	6.1%	7.7%		2.1%	2.9%	2.4%	
Occurrence of non target insects[2]				0.9%				0.9%
Occurrence of birds[2]				0.4%				0.0%
Occurrence of mammals[2]				0.9%				1.3%
Performance of animals					0.0%	6.7%	4.9%	8.9%

Grey highlighted values are significantly greater than 10%.

[1] Monitoring characters and their categories are defined in section 2.2.

[2] These characters are surveyed since 2009 season.

[3] This character is surveyed since 2008 season.

[4] The question on wildlife was asked until 2008. In 2009 it was split into three questions (non target insects, birds, mammals).

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Appendix A

Tables of free entries

Table A.1: Specifications for earlier or later planting of MON 810 (Section 3.1)

Country	Quest. Nr.	Planting time	Comments aggregate	Comments
Czech Republic	2587	earlier	weather	due to accessibility at the field, this field was dryer
Czech Republic	2583	later	flexibility	late delivery of the seeds
Czech Republic	2592	later	flexibility	the classic hybrid was sown around the YG one day later
Romania	2500	later	flexibility	the seeds arrived later

Table A.2: Insecticides applied in MON 810 (Section 3.1) differentiated by their use according to the registers

Active	**Insecticide as cited by the farmer**	**Spain**	**Portugal**	**Czech Republic**	**Slovakia**	**Romania**	**Total**
Seed treatment							
Clothianidin	Poncho	38					38
Imidacloprid	Confidor Generico, Gaucho	24				6	30
Thiamethoxam	Actara, Cruiser			7	1	11	19
Methiocarb	Mesurol			1			1
Total		62		8		17	88
Spray							
Lambda-Cyhalothrin	Karate Zeon		13				13
Deltamethrin	Decis expert		2				2
Beta-Cyfluthrin	Bulldock		1				1
Zeta-Cypermethrin	Fury					1	1
Total			16[1]			1	17
Granules, seed treatment and spray							
Chlorpyrifos	Ciclone, Clorpirifos, Danfito, Dursban	13	5				18
Cypermethrin	Faster					1	1
Total		13	5	0	0	1	19
Not common in maize							
Abamectin	Abac	8					8
Propargite	Omite					3	3
Cypermethrin	Cipermetrina, Telxiope	3					3
Thiacloprid	Calypso					1	1
Total		11				4	15
Total		86	21	8	1	23	139

[1] used to control *Tetranychus Urticae*, *Spodoptera Frugiperda*, *Agrotis Ipsilon* and *Heliothis Zea*

Table A.3: Herbicides applied in MON 810 (Section 3.1)

Active	**Herbicides as stated by the farmers**	**Spain**	**Portugal**	**Czech Republic**	**Slovakia**	**Romania**	**Poland**	**Total**
Acetochlor, Terbuthylazine	Click Plus, Controler, Guardian (Extra, Tetra), Harness GTZ, Lancero super, Trophy Gold	72		23	4			99
Nicosulfuron	Elite M, Epilog, Milagro, Mistral, Nico, Samson	37	3	5	2	7	1	55
Mesotrione	Callisto	7	14	13		6		40
S-Metolachlor, Terbuthylazine	Primextra Liquido (Gold, Twin, Gold TZ)	6	26					32
Acetochlor	Acetoclor, Challenger, Guardian (Safe Max), Harness (Plus), Regal	2		13	1	12		28
Bromoxynil	Buctril	15	6					21
Dicamba	Banvel, Diedro	15	1	2				18
Fluroxypyr	Starane 20	15					1	16
Mesotrione, S-Metolachlor, Terbuthylazine	Gardoprim Gold Plus, Lumax		1	11		2		14
Dimethenamid-P	Frontier, Spectrum		6			5		11
Mesotrione, S-Metolachlor	Camix	8	3					11

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Active	**Herbicides as stated by the farmers**	**Spain**	**Portugal**	**Czech Republic**	**Slovakia**	**Romania**	**Poland**	**Total**
Sulcotrione	Mikado, Sudoku, Zeus		11					11
2.4D, Florasulam	Mustang			5	1	3	1	10
Acetochlor, Diclormid	Trophy			9				9
Bentazone, Dicamba	Cambio					9		9
Isoxaflutol	Adengo, Merlin, Spade	2		1	1	5		9
Foramsulfuron, Iodosulfuron-methyl, Isoxadifen-ethyl	MaisTer			6	2			8
Terbuthylazine	Click			8				8
2.4 D	Dicopur, Esteron, SDMA 6					7		7
Rimsulfuron	Titus			1	1	4	1	7
Glyphosate	Glifosato, Roundup (Rapid)	2		1	2			5
Aclonifen, Isoxaflutol	Lagon	4						4
Flufenacet, Terbuthylazine	Aspect		3					3
Isoxadifen, Tembotrione	Laudis		3					3
active not known	Araclor, Niferol	1				1		2
Bentazone	Ladok		2					2
Dicamba, Tritosulfuron	Arrat			1	1			2

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Active	**Herbicides as stated by the farmers**	**Spain**	**Portugal**	**Czech Republic**	**Slovakia**	**Romania**	**Poland**	**Total**
Dimethenamid-P, Terbuthylazine	Link Combi		2					2
Foramsulfuron, Isoxadifen-ethyl	Equip, Option		1			1		2
Isoxaflutol	Atoll	2						2
Linuron	Linurex			2				2
Nicosulfuron, Rimsulfuron	Cordus					2		2
Bentazone, Terbuthylazine	Asteca mays		1					1
Clopyralid	Lontrel 100			1				1
Dicamba, Prosulfuron	Casper 55 WG				1			1
Isoxaflutol, Terbuthylazine	Merlin Duo					1		1
Nicosulfuron, Terbuthylazine	Winner Top		1					1
Rape oil	Istroecol				1			1
Rimsulfuron, Thifensulfuron	Grid			1				1
S-Metolachlor	Dual Gold					1		1
Total		188	84	103	17	66	4	462

Table A.4: Explanations for earlier/ later harvest of MON 810 (Section 3.1)

Country	Quest. Nr.	Harvest	Comments aggregate	Comments
Spain	2693	earlier	Desired flexibility (cropping system, logistics, channeling/ coexistence)	MON 810 is for animal feed, and I harvest it before than the conventional maize, that is for grain
Czech Republic	2553	earlier	Desired flexibility (cropping system, logistics, channeling/ coexistence)	by reason of purchase
Czech Republic	2561	earlier	weather	because of weather and accessibility to the field
Slovakia	2544	earlier	Desired flexibility (cropping system, logistics, channeling/ coexistence)	used for silage
Romania	2504	earlier	weather	drought!!!
Spain	2637	later	plant development, plant health, stay green effect, maturity (water content)	MON 810 delayed maturation one week in comparison to conventional maize
Spain	2638	later	plant development, plant health, stay green effect, maturity (water content)	MON 810 healthier, greener and delayed maturation 10 days in comparison to conventional maize
Spain	2644	later	plant development, plant health, stay green effect, maturity (water content)	MON 810 delayed maturation 15 days in comparison to conventional maize
Czech Republic	2546	later	plant development, plant health, stay green effect, maturity (water content)	YG is healthier because its not attacked by corn borer, thats why it can hold water longer and it maturates longer
Czech Republic	2551	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	separately stocking was necessary, sales reasons
Czech Republic	2554	later	plant development, plant health, stay green effect, maturity (water content)	vegetation had a longer green time

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Country	Quest Nr.	Harvest	Comments aggregate	Comments
Czech Republic	2556	later	plant development, plant health, stay green effect, maturity (water content)	later maturing
Czech Republic	2564	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	distribution reasons, necessary separate stocking
Czech Republic	2565	later	plant development, plant health, stay green effect, maturity (water content)	it was no attack of corn borer
Czech Republic	2568	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	because of a separated harvest
Czech Republic	2581	later	plant development, plant health, stay green effect, maturity (water content)	YG matured longer
Czech Republic	2583	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	late date of sowing
Czech Republic	2587	later	plant development, plant health, stay green effect, maturity (water content)	due to earlies (FAO) and moisture of maize
Czech Republic	2591	later	plant development, plant health, stay green effect, maturity (water content)	no damages by corn borer
Slovakia	2542	later	plant development, plant health, stay green effect, maturity (water content)	MON 810 mature more slowly
Romania	2500	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	later sowing
Romania	2517	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	Due to storage space and trading conditions
Romania	2522	later	Desired flexibility (cropping system, logistics, channeling/ coexistence)	Due to storage space and trading conditions

Table A.5: Explanations for characteristics of MON 810 different from "as usual" (Section 3.2)

Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Spain	2637	as usual	as usual	as usual	as usual	less often	delayed	higher yield	less often	MON 810 is resistant to ECB: does not fall down, gives more yield and less volunteers and the maturation is delayed
Spain	2638	as usual	as usual	delayed	delayed	less often	delayed	higher yield	less often	MON 810 is more healthy, flowering, growth and maturation are delayed, and without ECB attacks gives more yield, does fall down and gives less volunteers
Spain	2639	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 without ECB attack: does not fall down and gives more yield
Spain	2642	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 without ECB attack: does not fall down, there are not yield losses, gives more yield than the conventional maize
Spain	2643	more vigor-ous	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 is more vigorous. Being resistant to ECB, does not fall down and gives more yield than conventional maize
Spain	2644	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	MON 810 maturates 15 days later, does not suffer ECB attacks, not crop losses, and gives more yield
Spain	2645	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 ECB resistant: does not fall down, and gives 10% more yield than the conventional maize

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Spain	2646	as usual	as usual	as usual	as usual	less often	delayed	higher yield	less often	MON 810 is healthier without ECB attacks: does not fall down, there are not volunteers, maturates one week later and gives more yield
Spain	2647	as usual	delayed	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 has a longer time to emerge, and being resistant to ECB does not fall down and gives more yield than conventional maize
Spain	2649	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 without ECB problems is healthier and gives more yield than the conventional maize
Spain	2650	as usual	as usual	as usual	delayed	less often	delayed	higher yield	as usual	MON 810 is healthier, without ECB attacks, and maturates more slowly, does not fall down and gives more yield than the conventional maize
Spain	2651	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 without ECB, does not fall down, and gives 500 kg/Ha more than the conventional maize
Spain	2652	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	MON 810 without ECB attacks: does not fall down, maturation is delayed and gives mores yield than the conventional maize

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Spain	2653	more vigorous	accelerated	as usual	accelerated	less often	delayed	higher yield	less often	MON 810 is more vigorous, emerges earlier and grows more quickly, with more humidity, and delayed maturation, does not fall down and then there are not volunteers, and gives more yield than the conventional maize
Spain	2654	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 resistant to ECB: does not fall down and gives more yield than the conventional maize
Spain	2655	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 resistant to ECB: does not fall down and gives more yield than the conventional maize
Spain	2656	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	MON 810 without ECB attacks: does not fall down, less volunteers, and gives more yield than conventional maize
Spain	2657	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	less often	MON 810 produces 2.000 kg/Ha more than the conventional maize, because does not fall down (ECB resistance) and there are not volunteers the following season

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Spain	2660	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	MON 810 does not fall down, does not produce volunteers and produces 2.000 kg/Ha more than the conventional maize, since it does not have ECB attacks
Spain	2661	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	MON 810 gives more yield, does not fall down and does not produce volunteers, since it is resistant to ECB
Spain	2662	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 healthier, without ECB and gives more yield than the conventional maize
Spain	2664	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	MON 810 resistant to ECB: does not fall down, does not produce volunteers and gives more yield than the conventional maize
Spain	2665	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 gives more yield since it does not have ECB attacks
Spain	2666	as usual	as usual	delayed	as usual	as usual	as usual	as usual	as usual	MON 810 flowers a little later than the conventional maize
Spain	2667	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 healthier, without ECB, does not fall down and gives more yield than the conventional maize

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Spain	2669	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 without ECB damages, and gives more yield than the conventional maize
Spain	2670	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 does not fall down, does not produce volunteers, and gives more yield than the conventional maize, since it is resistant to ECB
Spain	2681	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	MON 810 is greener, healthier, with more humidity, delayed maturation and gives more yield than the conventional maize
Spain	2687	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 resistant to ECB: does not fall down and produces 500kg/Ha more than the conventional maize
Spain	2688	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	MON 810 resistant to ECB: does not fall down, does not produce volunteers, and yields more than the conventional maize
Spain	2694	as usual	as usual	as usual	as usual	as usual	as usual	lower yield	as usual	MON 810 gave less yield because of problems of viruses: Conventional maize did not have viruses

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Spain	2696	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 healthier, greener, without ECB damage: does not fall down and gives more yield than the conventional maize
Spain	2700	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 healthier, greener, without ECB damage: does not fall down and gives more yield than the conventional maize
Spain	2701	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 healthier, without ECB damage: does not fall down and gives more yield than the conventional maize
Spain	2707	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 resistant to ECB: does not fall down and gives more yield than the conventional maize
Spain	2709	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 without EGB damage, and gives more yield than the conventional maize
Spain	2711	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 without ECB attacks, does not fall down and gives more yield than the conventional maize

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Spain	2714	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 healthier, without ECB damages, and gives more yield than the conventional maize
Spain	2717	as usual	as usual	as usual	as usual	as usual	delayed	as usual	as usual	MON 810 gets maturation greener, with more humidity than the conventional maize; healthier since it does not have ECB
Spain	2723	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 without ECB damages, and gives more yield than the conventional maize
Spain	2724	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 produces more than the conventional maize, since it does not have crop losses secondary to ECB attacks
Spain	2731	as usual	as usual	as usual	as usual	less often	delayed	higher yield	less often	MON 810 healthier, greener, without ECB damages: does not fall, delayed maturation, gives more yield and does not produce volunteers in comparison with conventional maize
Spain	2732	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 healthier, without ECB damages, does not fall down and gives more yield than the conventional maize

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Country	**Quest. Nr.**	**Germi-nation**	**Emer-gence**	**Male flower-ing**	**Plant growth**	**Stalk/-root lodging**	**Maturity**	**Yield**	**Volun-teers**	**Comments**
Spain	2734	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	MON 810 healthier, without ECB damages, produces 300 kg/Ha more then the conventional maize
Spain	2735	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	MON 810 resistant to ECB: does not fall down and gives more yield than the conventional maize
Portugal	2595	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 13 000 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.
Portugal	2596	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.
Portugal	2597	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 14 000 / 15 000 kg/ha in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2598	more vigor-ous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 12 000 / 13 000 kg/ha in the transgenic maize, dry corn, 1,5 tonnes higher compared with conventional maize.
Portugal	2599	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.
Portugal	2600	more vigor-ous	as usual	as usual	as usual	less often	as usual	higher yield	as usual	less stalk/root lodging, greater germination vigor, strong and vigorous GM plants. The average yields of 14 000 / 15 000 kg/ha in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.
Portugal	2601	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 14 500 / 16 000 kg/ha in the transgenic maize, dry corn, 2,5 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2602	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 16 000 kg/ha in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.
Portugal	2603	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	Time to maturity delayed, green plant for a longer period of time. The average yields of 16 700 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.
Portugal	2604	more vigor-ous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 12 500 / 14 500 kg/ha in the transgenic maize, dry corn, 1,5 tonnes higher compared with conventional maize.
Portugal	2605	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 15 000 kg/ha in the transgenic maize, dry corn, 2 / 3 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Portugal	2606	more vigorous	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	Time to maturity delayed, green plant for a longer period of time. Greater germination vigor, strong and vigorous GM plants. The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 0,5 - 1 tonne higher compared with conventional maize.
Portugal	2607	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.
Portugal	2608	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	no statement	Time to maturity delayed, green plant for a longer period of time. The average yields of 15 500 kg/ha in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.
Portugal	2609	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 16 000 - 17000 kg/ha in the transgenic maize, dry corn, 2 - 3 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Portugal	2610	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 15 000 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.
Portugal	2611	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	Time to maturity delayed, green plant for a longer period of time. The average yields of 15 000 kg/ha in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.
Portugal	2612	more vigorous	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	Time to maturity delayed, green plant for a longer period of time. Greater germination vigor, strong and vigorous GM plants. The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 1,5 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2613	more vigor-ous	as usual	as usual	as usual	as usual	delayed	as usual	as usual	Greater germination vigor, strong and vigorous GM plants. Time to maturity delayed, green plant for a longer period of time. The average yields of 14 000 kg/ha in the transgenic maize, dry corn, similar yield as usual compared with conventional maize.
Portugal	2614	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	no state-ment	The average yields in the transgenic maize (dry corn) are higher by approximately 3% compared with conventional maize. The average yields are more related to the type of varieties of maize that is planted than properly to the type of maize planted (conventional or transgenic).
Portugal	2615	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 2 / 3 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2617	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	no state-ment	The average yields of 13 000 - 15 000 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize. The average yields are more related to the type of varieties of maize that is planted than properly to the type of maize planted (conventional or transgenic)
Portugal	2618	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 15 700 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize. The average yields are more related to the type of varieties of maize that is planted than properly to the type of maize planted (conventional or transgenic).
Portugal	2619	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Nearly the same yield in conventional and GM maize, ca 13000 kg/ha.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2620	more vigor-ous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 76 000 kg/ha (Forage maize) in the transgenic maize, dry corn, 3 tonnes higher compared with conven-tional maize.
Portugal	2621	more vigor-ous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 69 000 kg/ha (Forage maize) in the transgenic maize, dry corn, similar yields compared with conventional maize.
Portugal	2622	as usual	as usual	as usual	as usual	as usual	as usual	lower yield	as usual	The average yields of 14 000 kg/ha in the transgenic maize, dry corn, 1 tonne Lower compared with conventional maize.
Portugal	2623	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 11 000 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Portugal	2624	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 14 900 kg/ha in the transgenic maize, dry corn, 1 tonne higher compared with conventional maize.
Portugal	2625	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 66 000 kg/ha (Forage maize) in the transgenic maize, dry corn, similar yields compared with conventional maize.
Portugal	2626	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	The average yields of 84 000 kg/ha (Forage maize) in the transgenic maize, dry corn, similar yields compared with conventional maize.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2627	more vigor-ous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 13 500 kg/ha in the transgenic maize, dry corn, 0,5 tonne higher compared with conventional maize. The average yields are more related to the type of varieties of maize that is planted than properly to the type of maize planted (conventional or transgenic).
Portugal	2628	more vigor-ous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 75 000 kg/ha (Forage maize) in the transgenic maize, dry corn, similar yields compared with conventional maize.

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Portugal	2629	less vigorous	as usual	as usual	as usual	as usual	as usual	lower yield	as usual	Lower germination vigor. The average yields of 60 000 kg/ha (Forage maize) in the transgenic maize, dry corn, 15 tonnes lower compared with conventional maize (average yields of 75 000 kg/ha of forage maize in the conventional one). Probably related to to the type of varieties of maize that is planted than to the type of maize planted (conventional or transgenic).
Portugal	2630	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	no statement	The average yields of 65 000 - 70 000 kg/ha (Forage maize) in the transgenic maize, dry corn, 5 tonnes higher compared with conventional maize.
Portugal	2631	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 45 000 kg/ha (Forage maize) in the transgenic maize, dry corn, 5 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Portugal	2632	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The average yields of 55 000 kg/ha (Forage maize) in the transgenic maize, dry corn, 2 tonnes higher compared with conventional maize.
Portugal	2633	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 80 000 kg/ha (Forage maize) in the transgenic maize, dry corn, 10 tonnes higher compared with conventional maize.
Portugal	2634	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields in the transgenic maize, dry corn, were similar as usual compared with conventional maize.
Portugal	2635	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 15 500 kg/ha in the transgenic maize, dry corn, 1-1,5 tonnes higher compared with conventional maize.

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Portugal	2636	more vigor-ous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Greater germination vigor, strong and vigorous GM plants. The average yields of 13 000 - 14 000 kg/ha in the transgenic maize, dry corn, 2 - 3 tonnes higher compared with conventional maize.
Czech Republic	2546	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	lustier vegetation, no attack by corn borer
Czech Republic	2547	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	no state-ment	longer time green, better heath condition
Czech Republic	2548	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	no state-ment	longer green time, better health, no mechanical damage
Czech Republic	2549	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	better health condition
Czech Republic	2550	as usual	as usual	as usual	as usual	as usual	accel-erated	lower yield	as usual	lower yield because the maize was on the heavy soil unbalanced land, shorter time to maturity, because maize was harvested first
Czech Republic	2553	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	no state-ment	better health

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Country	**Quest. Nr.**	**Germination**	**Emergence**	**Male flowering**	**Plant growth**	**Stalk/-root lodging**	**Maturity**	**Yield**	**Volunteers**	**Comments**
Czech Republic	2554	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	less damaged (injured) stalks, longer vegetation, slower coming of maturity
Czech Republic	2556	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	due to higher FAO, later maturation. Higher yield of green mass for silage - the plants were healthy.
Czech Republic	2557	more vigorous	accelerated	as usual	as usual	less often	as usual	higher yield	no statement	no diseases, healthier growth, better field, sown as the first, better utilization of locality conditions, higher growth, better growth regeneration after hailstones
Czech Republic	2559	more vigorous	accelerated	as usual	accelerated	less often	as usual	higher yield	less often	healthy vegetation, lower losses, seed had high quality
Czech Republic	2560	no statement	no statement	no statement	no statement	no statement	no statement	no statement	no statement	these characteristics were not monitored
Czech Republic	2562	as usual	as usual	as usual	accelerated	as usual	as usual	higher yield	as usual	quicker growing, it was globally low presence of corn borer this year, larger habitus, minimum insults
Czech Republic	2563	as usual	as usual	as usual	as usual	no statement	delayed	higher yield	as usual	healthier plants, longer green, longer vegetation, Incidence of stalk/root lodging was not monitored.

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Czech Republic	2564	more vigorous	accelerated	as usual	as usual	less often	delayed	higher yield	as usual	healthier, better, longer green and vital growth
Czech Republic	2565	more vigorous	accelerated	delayed	delayed	less often	delayed	higher yield	as usual	high quality of seed, better seed desinfection, better health, longer flowering, healthy vegetation
Czech Republic	2566	as usual	as usual	as usual	delayed	less often	delayed	higher yield	as usual	better health, longer time green, no corn borer
Czech Republic	2567	as usual	as usual	as usual	as usual	less often	as usual	as usual	less often	There was no damage by corn borer in stems or other parts of the plants, that why the plants are resistant to lodging. There was minimal stalk lodging and significant minimization of yield loss.
Czech Republic	2568	as usual	accelerated	delayed	as usual	less often	delayed	as usual	less often	due to the field, health vegetation, plants are longer green
Czech Republic	2569	as usual	as usual	as usual	as usual	as usual	delayed	as usual	no statement	no corn borer
Czech Republic	2570	as usual	as usual	as usual	as usual	less often	delayed	higher yield	no statement	maturity - according to FAO, healthy plants with bigger cobs

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Country	**Quest. Nr.**	**Germi-nation**	**Emer-gence**	**Male flower-ing**	**Plant growth**	**Stalk/-root lodging**	**Maturity**	**Yield**	**Volun-teers**	**Comments**
Czech Republic	2572	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	no state-ment	better health condition, without damage by corn borer
Czech Republic	2574	less vigor-ous	delayed	as usual	as usual	less often	delayed	higher yield	less often	MON 810 is possibly more sensitive to soil temperature –> delayed germi-nation and time to emergence, plants healthy and without any damages –> less stalk/root lodging, higher yield, FAO –> delayed time to maturity
Czech Republic	2575	as usual	as usual	as usual	as usual	less often	as usual	as usual	as usual	no corn borer
Czech Republic	2576	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	there was a higher sawing rate in YG that in conventional maize
Czech Republic	2578	as usual	as usual	as usual	as usual	less often	accel-erated	higher yield	less often	no corn borer –> less stalk/root lodging, favorable weather conditions –> accel-erated time to maturity, higher yield, win-ter freesing injury –> less volunteers
Czech Republic	2579	as usual	as usual	as usual	as usual	less often	as usual	higher yield	no state-ment	no losses because of stalk breaking –> higher yield

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Czech Republic	2580	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	healthy and vital plants, no attack of pests, no caking
Czech Republic	2581	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	without corn borer, no lodging vegetation
Czech Republic	2582	as usual	as usual	as usual	as usual	less often	as usual	as usual	no statement	no corn borer
Czech Republic	2583	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	later date of sowing, higher FAO, better health, longer green vegetation
Czech Republic	2587	more vigorous	accelerated	as usual	as usual	as usual	as usual	higher yield	no statement	Germination vigor was more because YG was sown earlier, characteristics of the field –> accelerated time to emergence, higher yield
Czech Republic	2589	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	no statement	no corn borer
Czech Republic	2590	as usual	as usual	as usual	as usual	as usual	as usual	as usual	less often	no volunteers
Czech Republic	2591	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	higher yield, delayed time to maturity because maize was not damaged by corn borer

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Czech Republic	2592	as usual	as usual	as usual	as usual	less often	accelerated	higher yield	as usual	lodging was not ascertained, period of maturity and yield in linked by good health
Czech Republic	2594	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	no corn borer –> no losses –> higher yield
Slovakia	2540	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	no corn borer, better health, volunteers was plough under of subsoil ploughing
Slovakia	2542	as usual	as usual	as usual	delayed	less often	delayed	higher yield	no statement	MON 810 is more upright - no lodging, vegetation is healthier, that is reason of delayed time to maturity and higher yield. Yield increase over normal production of 1.5 - 2.5 t/ha
Slovakia	2543	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	not broken
Slovakia	2545	as usual	as usual	as usual	as usual	less often	as usual	as usual	as usual	healthy stems, no corn borer
Romania	2500	as usual	as usual	as usual	as usual	less often	as usual	as usual	no statement	no presence of volunteers of previous crops
Romania	2501	more vigorous	accelerated	accelerated	accelerated	less often	as usual	higher yield	no statement	due to differences/specifics of the varieties

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Country	Quest. Nr.	Germination	Emergence	Male flowering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volunteers	Comments
Romania	2502	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	no statement	higher production due to less losses (good control of ostrinia)
Romania	2503	as usual	as usual	as usual	as usual	as usual	as usual	as usual	no statement	no cultivation in 2008
Romania	2504	as usual	as usual	accelerated	accelerated	less often	accelerated	as usual	no statement	accelerated metabolism
Romania	2505	as usual	as usual	accelerated	accelerated	as usual	as usual	higher yield	less often	no volunteers
Romania	2512	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	A reduced number of stalk lodging and fallen corn cobs
Romania	2514	as usual	as usual	as usual	as usual	less often	as usual	as usual	less often	It is quite resistant against volunteers
Romania	2531	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	higher production
Romania	2532	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	"Higher production; Stronger stalk"
Romania	2533	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	Higher production (less pests), stronger and more resistant stalks

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Country	Quest. Nr.	Germi-nation	Emer-gence	Male flower-ing	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Romania	2537	as usual	as usual	as usual	accel-erated	less often	as usual	as usual	as usual	The plant grows faster and it is more re-sistant, the stalk is thicker
Romania	2538	as usual	as usual	as usual	accel-erated	less often	accel-erated	higher yield	as usual	Higher production, the plant matures faster, the stalk is stronger
Romania	2539	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Higher production
Poland	2738	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Didn't know exactly how much higher the yield was, but is was visible thet the yields will be greater. probably to the larger ECB appearance than in the last year.
Poland	2739	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Yield higher about 10%, very good plant performance

Table A.6: Additional observation during plant growth (Section 3.2)

Country	Quest. Nr.	Additional observations during plant growth
Spain	2661	Better quality of grain in MON 810 in comparison with conventional maize
Spain	2677	MON 810 with higher humidity than the conventional maize
Spain	2692	When there are not ECB attacks, I do not see differences between MON 810 and conventional maize
Portugal	2616	The average yields in the transgenic maize, dry corn, were similar as usual compared with conventional maize
Czech Republic	2557	The whole are of GMO maize was during the flowerage damaged by strong hailstones
Slovakia	2540	No attack of corn borer
Romania	2503	smaller incidence of ostrinia
Romania	2512	A better quality of seeds / grains due to the reduced presence of certain mycotoxic fungi (ciuperci micotoxice) on the grains
Romania	2513	A better control of pests throughout the vegetation period
Romania	2514	It is much more efficient, the stem plants do not break so easy, less pests

Table A.7: Additional comments on disease susceptibility (Section 3.3)

Country	Quest. Nr.	Disease suscepti-bility	Comments
Spain	2694	more	MON 810 with viruses problems (MDMV / MRDV) and yield losses. It does not happen in conventional maize
Spain	2637	less	Less problems of Ustilago maydis in MON 810. In MON 810 better health, without Ustilago attacks, that afect to conventional maize
Spain	2642	less	MON 810 grain without ECB damages, healthier and Fusarium has problems to go in maize grain
Spain	2653	less	MON 810 ear healthier since it does not have ECB damages, it resists better to Sphacelotheca reiliana attacks than the conventional one
Portugal	2596	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2598	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2603	less	Cephalosporium spp. is one of the main reasons for producing transgenic maize.
Portugal	2610	less	Cephalosporium spp. and the amazing control of the maize borer are the main reasons for producing transgenic maize.
Portugal	2614	less	There are no room for doubt that the largest health / sanity of GM maize makes plants less susceptible to all kinds of diseases.
Portugal	2615	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2617	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2621	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2622	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2623	less	The largest health / sanity of GM maize makes plants less susceptible to diseases. Also depends from the region (soil and climate) where the cultures were planted.
Portugal	2626	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.

continued from previous page

Country	Quest. Nr.	Disease suscepti-bility	Comments
Portugal	2628	less	There are no room for doubt that the largest health / sanity of GM maize makes plants less susceptible to all kinds of diseases.
Portugal	2630	less	The largest health / sanity of GM maize makes plants less susceptible to diseases. Also depends from the region (soil and climate) where the cultures were planted.
Portugal	2631	less	The largest health / sanity of GM maize makes plants less susceptible to diseases.
Portugal	2633	less	The largest health / sanity of GM maize makes plants less susceptible to diseases. Also depends from the region (soil and climate) where the cultures were planted.
Czech Republic	2560	less	BT maize was less susceptible for fungi.
Czech Republic	2574	less	There was no entering gate for fusarium, because of absence of corn borer
Czech Republic	2579	less	plants are globally healthier because they are not damaged by corn borer
Czech Republic	2581	less	no attack of corn borer

Table A.8: Additional comments on insect pest control (Section 3.4)

Country	Quest. Nr.	*Ostrinia nubilalis*	*Sesamia spp.*	Comments
Portugal	2596	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2597	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2599	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2600	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2601	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2613	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2616	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2618	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2619	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2623	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2626	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2627	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2628	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2629	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2631	very good	very good	Overall effectiveness in the control of maize borer in GM fields.
Portugal	2632	very good	very good	Fantastic results almost perfect effectiveness in the control of maize borer in GM fields.
Portugal	2634	very good	very good	Effectiveness frightening almost perfect in the control of maize borer in GM fields.
Czech Republic	2579	very good	no statement	no corn borer in YG

Table A.9: Additional comments on pest susceptibility (Section 3.5)

Country	Quest. Nr.	Pest susceptibility	Order of insect pest	Comments
Czech Republic	2567	more	Hemiptera / Coleoptera	the reason of higher susceptibility was absence of insecticides against corn borer, that also reduce Aphids and Diabrotica
Czech Republic	2586	more	Coleoptera	YG was not desinfected, conventional maize was desinfected only for fungicides
Spain	2687	less	Diptera	MON 810 with less Mosquito attacks than the conventional maize
Spain	2696	less	Lepidoptera	In MON 810 the Mitima attack is smaller than in the conventional maize
Spain	2731	less	Lepidoptera	MON 810 without Heliothis attacks, whereas conventional maize shows damages caused by this insect
Portugal	2595	less	Arachnida / Lepidoptera	The region where maize is grown (soil and climate) has more influence than any real variety and type of corn planted (conventional or transgenic).
Portugal	2596	less	Lepidoptera	The other pests usually attack less the fields of GM maize.
Portugal	2597	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2598	less	Lepidoptera	The other pests usually attack less the fields of GM maize. Do not know the reason for such event / fact.
Portugal	2601	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2602	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2603	less	Lepidoptera	The other pests usually attack less the fields of GM maize. However this year do not found difference in susceptibility with Agrotis Ipsilon pest.
Portugal	2608	less	Arachnida / Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2609	less	Lepidoptera	The other pests usually attack less the fields of GM maize. Do not know the reason for such event / fact.
Portugal	2611	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.

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Country	Quest. Nr.	Pest susceptibility	Order of insect pest	Comments
Portugal	2614	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2615	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2617	less	Lepidoptera	The other pests usually attack less the fields of GM maize. However this year do not found difference in susceptibility with Agrotis Ipsilon pest.
Portugal	2618	less	Lepidoptera	Negligible atack of diseases in the region. However there is less susceptibility in YG maize.
Portugal	2619	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2621	less	Lepidoptera	The other pests usually attack less the fields of GM maize. Do not know the reason for such event / fact.
Portugal	2622	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2626	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2628	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2629	less	Lepidoptera	The other pests usually attack less the fields of GM maize. Do not know the reason for such event / fact. Probably related to the best health and sanity of GM maize.
Portugal	2631	less	Lepidoptera	The other pests usually attack less the fields of GM maize. Do not know the reason for such event / fact.
Portugal	2632	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2633	less	Lepidoptera	The other pests usually attack less the fields of GM maize.
Portugal	2634	less	Lepidoptera	Clearly best sanity of GM maize make GM plants less susceptible to other pests.
Portugal	2635	less	Lepidoptera	Best health and sanity of GM maize make GM plants less susceptible to other pests.

Table A.10: Additional comments on weed pressure (Section 3.6)

Country	Quest. Nr.	Weed pressure	Comments
Slovakia	2540	no statement	the agronomist cannot appraise the total occurrence
Portugal	2597	as usual	The intensity of occurrence of weeds is exactly the same in the fields of GM maize or in the fields of conventional maize.
Portugal	2600	as usual	The pressure and occurrence of weeds depends on the region (climate and soil) and not from the variety or type of maize planted.
Portugal	2602	as usual	The pressure and occurrence of weeds depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2612	as usual	The intensity of occurrence of weeds is exactly the same in the fields of GM maize or in the fields of conventional maize. It depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2616	as usual	The intensity of occurrence of weeds is exactly the same in the fields of GM maize or in the fields of conventional maize. It depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2618	as usual	It depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2625	as usual	The pressure and occurrence of weeds depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2626	as usual	It depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2628	as usual	The pressure and occurrence of weeds depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2630	as usual	The intensity of occurrence of weeds is exactly the same in the fields of GM maize or in the fields of conventional maize. It depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.

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Country	**Quest. Nr.**	**Weed pressure**	**Comments**
Portugal	2635	as usual	The intensity of occurrence of weeds is exactly the same in the fields of GM maize or in the fields of conventional maize. It depends on the region (climate and soil) and also from different planting techniques and not from the variety or type of maize planted.
Portugal	2636	as usual	Depends exclusively on the planting techniques and not from the variety or type of maize planted.
Spain	2638	less	MON 810 with less problems of weeds, since it grows higher, with more vegetation, shading the soil and avoiding the growth of weeds.

Table A.11: Specifications on the occurrence of insects (section 3.7)

Country	Quest. Nr.	Occurrence of insects	Specification
Romania	2512	less	It seemed to me quite resistant on insects attacks
Romania	2514	less	Less arthropod insects on the plants
Czech Republic	2565	more	no use of insecticides
Portugal	2614	more	The farmer especially this year found a higher incidence/occurrence of insects (Ladybugs) in MON 810 fields. Do not know very well explain the facts about but it was evident in the fields.

Table A.12: Specifications on the occurrence of mammals (section 3.7)

Country	**Quest. Nr.**	**Occurrence of mammals**	**Specification**
Czech Republic	2565	less	less wild pigs, we don't know the reason
Portugal	2628	less	The farmer especially in this year's campaign found a lower occurrence of mammals (Boars) in MON 810 fields compared with the conventional maize fields. Do not know the direct explanations for this event but it was evident and clearly in the fields.
Portugal	2634	more	The farmer especially in this year's campaign found a higher occurrence of mammals (Hares) in MON 810 fields. Hares attack more the grains of transgenic plants at birth (initial parts of growth and development of plants).

Table A.13: Specifications of the performance of animals fed MON 810 (section 3.8)

Country	Quest. Nr.	Performance of animals	Specification
Portugal	2608	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Is exactly equal to what happens with the main alimentation with the conventional maize.
Portugal	2612	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Is exactly equal to what happens with the main alimentation with the conventional maize.
Portugal	2613	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Is exactly equal to what happens with the main alimentation with the conventional maize.
Portugal	2621	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Is exactly equal to what happens with the main alimentation with the conventional maize.
Portugal	2626	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Is exactly equal to what happens with the main alimentation with the conventional maize.
Portugal	2627	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Is exactly equal to what happens with the main alimentation with the conventional maize.
Portugal	2628	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Even all the analysis made from the milk of the cattle herd that fed on GM maize did not detect any anomalies.
Portugal	2629	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Even all the analysis made from the milk of the cattle herd that fed on GM maize did not detect any anomalies.
Portugal	2630	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Even all the analysis made from the milk of the cattle herd that fed on GM maize did not detect any anomalies.

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Country	Quest. Nr.	Performance of animals	Specification
Portugal	2631	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Even all the analysis made from the milk of the cattle herd that fed on GM maize did not detect any anomalies.
Portugal	2632	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Even all the analysis made from the milk of the cattle herd that fed on GM maize did not detect any anomalies.
Portugal	2633	as usual	The growth and development of animals fed with GM maize is perfectly normal, without any negative effects to refer. Even all the analysis made from the milk of the cattle herd that fed on GM maize did not detect any anomalies.
Czech Republic	2559	as usual	increased production because feed is without diseases (but I surely cannot speak if it is owing to GMO).
Romania	2514	as usual	No side effects on animals health
Czech Republic	2546	different	Animals are lustier because they get feed without fungus. They have healthy liver so that the live longer and they are able to a longer production. Milk has higher quality.
Czech Republic	2563	different	better health, less inflammations
Czech Republic	2565	different	better health condition
Czech Republic	2591	different	better quality of feed due to the minimum occurrence of mycotoxins
Czech Republic	2586	do not know	it was not fed so far

Table A.14: Additional remarks or observations (section 3.9)

Country	Quest. Nr.	Additional remarks
Portugal	2595	Environmental factors (climate and soil) affect more than any real variety and type of corn planted (conventional or transgenic). Areas where the pests do not attack to much, do not worth economically producing transgenic maize.
Portugal	2596	The safety and reducing the risks of production along with the best health plant influence farmers to choose the GM maize.
Portugal	2597	Best health and sanity of GM maize, lower costs with plant protection products (insecticides, herbicides,...), reduce the risks of production.
Portugal	2598	Despite the "producer price" be equal between the transgenic and the conventional maize, the reduction of costs through the use of pesticides equalize the additional costs with the transgenic maize seeds.
Portugal	2600	The safety and reducing the risks of production along with the best health plant influence farmers to choose the GM maize. The main problem is the similar "producer price" between the transgenic maize and the conventional maize.
Portugal	2601	Best health and sanity of GM maize, lower costs with plant protection products (insecticides, herbicides,...), reduce the risks of production.
Portugal	2602	One of their main concerns is that the farmers can not use a different range of biotechnology for maize crop. The safety and reducing the risks of production along with the best health plant influence farmers to choose the GM maize. The other problem is the similar "producer price" between the transgenic maize and the conventional maize.
Portugal	2606	Best health and sanity of GM maize, reduce the risks of production. Is always safer to produce transgenic maize with increased in productivities (yields) but also in intrinsic qualities of the GM maize.
Portugal	2607	An important and significant reduction in the use of quantities of pesticides in GM maize contributed to better environmental protection and also in the protection of animal life in soils.
Portugal	2608	The quality of GM maize is clearly higher compared with the conventional maize. An important and significant reduction in the use of quantities of pesticides in GM maize contributed to better environmental protection and also in the protection of animal life in soils.
Portugal	2609	Excellent yields produced with GM maize is one of the most significant specific features in transgenic maize

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Country	Quest. Nr.	Additional remarks
Portugal	2610	Best health and sanity of GM maize, reduce the risks of production. Cephalosporium spp. is one of the main reasons for producing transgenic maize.
Portugal	2612	An important and significant reduction in the use of quantities of pesticides in GM maize contributed to better environmental protection and also in the protection of animal life in soils. Best health and sanity of GM maize, reduce the risks of production. Excellent yields produced with GM maize.
Portugal	2613	One important problem to note is the similar "producer price" between the transgenic maize and the conventional maize. An important and significant reduction in the use of quantities of pesticides in GM maize contributed to better environmental protection.
Portugal	2614	Despite the "producer price" be equal between the transgenic and the conventional maize, the reduction of costs through the use of pesticides equalize the additional costs with the transgenic maize seeds. Best health and sanity of GM maize, reduce the risk of production. Is always safer to produce transgenic maize with increased in productivities (yields) but also in intrinsic qualities of the GM maize.
Portugal	2617	Is always safer to produce transgenic maize with increased in productivities (yields) but also in intrinsic qualities of the GM maize. Best health and sanity of GM maize, lower costs with plant protection products (insecticides, herbicides,...), reduce the risks of production.
Portugal	2618	Best health and sanity of GM maize, lower costs with plant protection products (insecticides, herbicides,...), reduce the risks of production. The average yields are more related to the type of varieties of maize that is planted than properly to the type of maize planted (conventional or transgenic).
Portugal	2621	The quality of GM maize is clearly higher compared with the conventional maize. An important and significant reduction in the use of quantities of pesticides in GM maize contributed to better environmental protection and also in the protection of animal life in soils.
Portugal	2624	The safety and reducing the risks of production along with the best health plant influence farmers to choose the GM maize.
Portugal	2626	The quality of GM maize is clearly higher compared with the conventional maize.

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Country	Quest. Nr.	Additional remarks
Portugal	2627	Best health and sanity of GM maize, reduce the risks of production. Is always safer to produce transgenic maize with increased in productivities (yields) but also in intrinsic qualities of the GM maize. Despite the "producer price" be equal between the transgenic and the conventional maize, the reduction of costs through the use of pesticides equalize the additional costs with the transgenic maize seeds.
Portugal	2628	The main reason for producing transgenic maize is the production safety and the significant and marked reducing the risks of production along with the health and sanity of transgenic maize plants.
Portugal	2629	Environmental factors (climate and soil) affect more than any real variety and type of corn planted (conventional or transgenic). Areas where the pests do not attack to much, do not worth economically producing transgenic maize.
Portugal	2633	Excellent yields produced with GM maize is one of the most significant specific features in transgenic maize
Portugal	2635	Best health and sanity of GM maize, reduce the risks of production. Is always safer to produce transgenic maize with increased in productivities (yields) but also in intrinsic qualities of the GM maize. Despite the "producer price" be equal between the transgenic and the conventional maize, the reduction of costs through the use of pesticides equalize the additional costs with the transgenic maize seeds.
Portugal	2636	The MON 810 maize genetically modified is more pure, presents less levels of toxins.The quality of GM maize is clearly higher compared with the conventional maize.

Table A.15: Motivations for not complying with the label recommendations (section 4.2)

Country	Quest. Nr.	Compliance	Reasons
Spain	2640	no	I did not plant a refuge.
Spain	2654	no	I did not plant a refuge.
Spain	2670	no	I did not plant a refuge.
Spain	2686	no	I did not read the recommendations (had no).
Spain	2700	no	I did not plant a refuge.
Spain	2724	no	I did not plant a refuge.
Spain	2725	no	I did not plant a refuge.
Portugal	2595	no	Chose techniques based on all her production experience.
Portugal	2600	no	Chose techniques based on all his production experience.
Portugal	2629	no	Chose techniques based on all her production experience.

Table A.16: Motivations for not planting a refuge (section 4.3)

Country	Quest. Nr.	Plant refuge?	Reasons
Spain	2640	no	It complicates the sowing
Spain	2654	no	It complicates the sowing
Spain	2670	no	It complicates the sowing
Spain	2680	no	I have small parcels with MON 810
Spain	2686	no	I did not read the recommendations
Spain	2700	no	ECB produces big losses
Spain	2724	no	It complicates the sowing
Spain	2725	no	It complicates the sowing
Portugal	2595	no	Belongs to a “production area”!
Portugal	2599	no	Belongs to a “production area”!
Portugal	2600	no	Belongs to a “production area”!
Portugal	2601	no	Belongs to a “production area”!
Portugal	2602	no	Belongs to a “production area”!
Portugal	2607	no	Belongs to a “production area”!
Portugal	2628	no	Belongs to a “production area”!
Portugal	2629	no	Belongs to a “production area”!
Portugal	2630	no	Belongs to a “production area”!
Portugal	2631	no	Belongs to a “production area”!
Portugal	2633	no	Belongs to a “production area”!
Czech Republic	2564	no	no, because it is a separate insulated soil plot, (missunderstanding of the refuge)[1]
Czech Republic	2574	no	because YC was sown in a distance > 750 m (missunderstanding of the refuge principle)[1]
Czech Republic	2594	no	there was the sufficient insulation distance (missunderstanding of the refuge)[1]
Romania	2535	no	he stated “yes” but explained that he planted Sunflower and cereals for refuge, so the statement was corrected to “no”

[1] this comment is a conclusion that was drawn by the interviewer during the interview with the farmer

Appendix B

Questionnaire

2	0	0	9	-	0	1	-	M	O	N	-	G	E	-			-				-		
Year				-	Event		-	Partner			-	Country		-Interviewer-				Farmer			-	Area	

EuropaBio Monitoring WG Farmer Questionnaire

Product: insect protected YieldGard® maize

Farmer personal and confidential data

Name of farmer: ____________________________________

Address of farmer: ____________________________________

City: ____________________________________

Postal code: ____________________________________

Name of interviewer: ____________________________________

Date of interview (DD / MM / YYYY):_____/______/_________

The personal data of the farmer will be handled in accordance with applicable data protection legislation. The personal data of the farmers may be used for the purpose of interviews necessary for the survey if the farmers have authorised this use as per the data protection legislation.

The questionnaires will be encoded to protect farmers' identity in the survey and confidentiality agreements will be put in place between the different parties (i.e. authorisation holders, licensees, interviewers and analyst) to further enforce this. The identity of a farmer will only be revealed to the authorisation holders if an adverse effect linked to their trait has been identified and needs to be investigated.

Furthermore, the agreements between the different parties will also ensure that any information collected in the questionnaires will not be improperly shared or used.

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2	0	0	9	-	0	1	-	M	O	N	-	G	E	-			-			-		

Year - Event - Partner - Country -Interviewer- Farmer - Area

Code:

Year ☐☐☐☐ Event ☐☐ Partner ☐☐☐ Country ☐☐ Interviewer ☐☐

Farmer ☐☐ Area ☐☐

Coding explanations:

2	0	0	9	-	0	1	-	M	O	N	-	E	S	-	0	1	-	0	1	-	0	1

Year — Event Code — Partner[1] Code — Country Code — Interviewer[2] Code — Farmer Code — Area Code

Codes:

Event:	01	MON 810
	02	NK 603
	03	…
Partner[1]:	MON	Monsanto
	MAR	Markin
	DAT	Datagri
	…	
Country:	ES	Spain
	FR	France
	GE	Germany
	…	
Interviewer[2]:	01 A	
	02 B	
	03 …	

Farmer: incremental counter within the interviewer

Area: incremental counter within the farmer

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[1] Partner is the organization that implements the survey

[2] Interviewer is the employee from the Partner that is contacting the farmers

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2	0	0	9	-	0	1	-	M	O	N	-	G	E	-			-			-		

Year - Event - Partner - Country -Interviewer- Farmer - Area

1 Maize grown area

1.1 Location:

Country: ____

County: ____

1.2 Surrounding environment:

Which of the following would best describe the land usage in the surrounding of the areas planted with YieldGard® maize

O Farmland
O Forest or wild habitat
O Residential or industrial

1.3 Size and number of fields of the maize cultivated area:

Total area of all maize cultivated on farm (ha) ________________

Total area of YieldGard® maize cultivated on farm (ha) ________________

Number of fields cultivated with YieldGard® maize ______________

1.4 Maize varieties grown:

List up to five YieldGard® maize varieties planted this season:

1. _________________________
2. _________________________
3. _________________________
4. _________________________
5. _________________________

List up to five conventional varieties planted this season:

1. _________________________
2. _________________________
3. _________________________
4. _________________________
5. _________________________

Are you growing any other GM maize varieties this season?[3]

O Yes O No

[3] Note: This question does not need to be asked in the 2009 season.

1.5 Soil characteristics of the maize grown area:

Mark the predominant soil type of the maize grown area (soil texture):

O very fine (clay)
O fine (clay, sandy clay, silty clay)
O medium (sandy clay loam, clay loam, sandy silt)
O medium-fine (silty clay loam, silt loam)loam)
O coarse (sand, loamy sand, sandy loam)
O no predominant soil type (too variable across the maize grown area on the farm)
O I do not know

Characterize soil quality of the maize grown area (fertility):

O below average - poor
O average - normal
O above average -good

Organic carbon content (%) ____________________

1.6 Local pest and disease pressure in maize:

Characterize this season's general pest pressure on the maize cultivated area:

Diseases (fungal, viral)	O Low	O As usual	O High
Pests (insects, mites, nematodes)	O Low	O As usual	O High
Weeds	O Low	O As usual	O High

2 Typical agronomic practices to grow maize on your farm

2.1 Irrigation of maize grown area:

O Yes O No

If yes, which type of irrigation technique do you apply:

O Gravity O Sprinkler O Pivot O Other

2.2 Major rotation of the maize grown area:

previous year: ________________________

two years ago: ________________________

2.3 Soil tillage practices:

O No O Yes (mark the time of tillage: O Winter O Spring)

2.4 Maize planting technique:

O Conventional planting
O Mulch
O Direct sowing

2.5 Mark all typical weed and pest control practices in maize at your farm:

O Herbicide(s)

O Insecticide(s)
If box checked, do you treat against maize borers? O Yes O No

O Fungicide(s)
O Mechanical weed control
O Use of bio control treatments (e.g. Trichogramma)
O Other, please specify: ____________________

2.6 Application of fertilizer to maize grown area:

O Yes O No

2.7 Typical time of maize sowing *range* ***(DD:MM – DD:MM):***

________/________ -- ________/_________

2.8 Typical time of maize harvest *range* ***(DD:MM – DD:MM):***

Grain maize: ________/________ -- ________/_________
Forage maize: ________/________ -- ________/_________

3 Observations of YieldGard® maize

3.1 Agricultural practices in YieldGard® maize (compared to conventional maize)

Did you change your agricultural practices in YieldGard® maize compared to conventional maize? If any of the answers is different from «As usual», please specify the change.

How did you perform your crop rotate for YieldGard® maize compared with conventional maize?

O As usual O Changed, because (*describe the rotation*): _____________

____

____

Did you plant YieldGard® maize earlier or later than conventional maize?

O As usual O Earlier O Later, because: ________________________

Did you change your soil tillage or maize planting techniques to plant YieldGard® maize?

O As usual O Changed, because: ______________________________

Full commercial name of insecticides you applied in YieldGard® maize field, including seed treatments:

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

Full commercial name of herbicides you applied in YieldGard® maize field:

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

Full commercial name of fungicides you applied in YieldGard® maize field:

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________

In 2009, how were the weed and pest control practices in YieldGard® maize when compared to conventional maize?

Insecticides: O Similar O Different, because:______________________

Herbicides: O Similar O Different, because:______________________

Fungicides: O Similar O Different, because:______________________

In 2009, did you change maize borer control practices in YieldGard® maize when compared to conventional maize?

O Similar O Changed, because:______________________

In 2009, how were the fertilizer application practices in YieldGard® maize when compared to conventional maize?

O Similar O Changed, because:______________________

In 2009, how were the irrigation practices in YieldGard® maize when compared to conventional maize?

O Similar O Changed, because:________________________________

Did you harvest YieldGard® maize earlier or later than conventional maize?

O Similar O Earlier O Later Because:________________________

3.2 Characteristics of YieldGard® maize in the field (compared to conventional maize)

Germination vigour	O As usual	O More vigorous	O Less vigorous
Time to emergence	O As usual	O Accelerated	O Delayed
Time to male flowering	O As usual	O Accelerated	O Delayed
Plant growth and development	O As usual	O Accelerated	O Delayed
Incidence of stalk/root lodging	O As usual	O More often	O Less often
Time to maturity	O As usual	O Accelerated	O Delayed
Yield	O As usual	O Higher yield	O Lower yield
Occurrence of volunteers from previous year planting (if relevant)	O As usual	O More often	O Less often

If any of the answers above is different from «As usual», please specify: ____

Please detail any additional unusual observations regarding the YieldGard® maize maize during its growth:____

3.3 *Characterise the YieldGard® maize susceptibility to disease (compared to conventional maize)*

Overall assessment of disease susceptibility of YieldGard® maize compared to conventional maize (fungal, viral diseases):

O As usual   O More susceptible[4]   O Less susceptible[4]

If the above answer is different from «As usual», please specify the difference in disease susceptibility in the list and the commentary section below:

1. *Fusarium* spp	O More	O Less
2. *Ustilago maydis = U. zeae*	O More	O Less
3. xxx	O More	O Less
4. xxx	O More	O Less
5. xxx	O More	O Less
6. Other: ____________________	O More	O Less

Additional comments: ____

____

____

3.4 *Characterise the INSECT pest control in YieldGard® maize fields (compared to conventional maize)*

On the two insects controlled by YieldGard® maize, overall efficacy of the GM varieties on:

1. European corn borer (Ostrinia nubilalis):

   O Very good   O Good   O Weak   O Don't Know

2. Pink borer (Sesamia spp):

   O Very good   O Good   O Weak   O Don't Know

Additional comments: ____

____

____

3.5 *Characterise the YieldGard® maize susceptibility to OTHER pests susceptibility (compared to conventional maize)*

Except the two insects mentioned above, overall assessment of pest susceptibility of YieldGard® maize compared to conventional maize (insect, mite, nematode pests):

O A usual   O More susceptible   O Less susceptible

[4] More susceptible than conventional maize or Less susceptible than conventional maize

If the above answer is different from «As usual», please specify the difference in pest susceptibility in the list and the commentary section below:

1. ______________________ O More O Less
2. ______________________ O More O Less
3. ______________________ O More O Less
4. ______________________ O More O Less
5. ______________________ O More O Less

Additional comments: ____

____

3.6 Characterise the weed pressure in YieldGard® maize fields (compared to conventional maize)

Overall assessment of the weed pressure in YieldGard® maize compared to conventional maize:

O As usual O More weeds O Less weeds

List the three most abundant weeds in your YieldGard® maize field:

1. ____________________________________
2. ____________________________________
3. ____________________________________

Were there any unusual observations regarding the occurrence of weeds in YieldGard® maize? ____

____

3.7 Occurrence of wildlife in YieldGard® maize fields (compared to conventional maize)

General impression of the occurrence of wildlife (insects, birds, and mammals) in YieldGard® maize compared to conventional maize fields:

Occurrence of insects (arthropods):

O As usual O More O Less O Do not know

If the answer above is «More» or «Less», please specify your observation:

____

Occurrence of birds:

O As usual O More O Less O Do not know

If the answer above is «More» or «Less», please specify your observation:

____

____

Occurrence of mammals:

O As usual O More O Less O Do not know

If the answer above is «More» or «Less», please specify your observation:

____

____

3.8 Feed use of YieldGard® maize (if previous year experience with this event)

Did you use the YieldGard® maize harvest for animal feed on your farm?

O Yes O No

If "Yes", please give your general impression of the performance of the animals fed YieldGard® maize compared to animals fed conventional maize.

O As usual O Different O Do not know

If the answer above is «Different», please specify your observation:

____

____

____

3.9 Any additional remarks or observations [e.g. from fields planted with event xxxx that were not selected for the survey]

____

____

____

____

____

4 Implementation of Bt-maize specific measures

4.1 Have you been informed on good agricultural practices for YieldGard® maize?

O Yes O No

Only if you answered “Yes”, would you evaluate these technical sessions as:

O Very useful O Useful O Not useful

4.2 Seed

Was the seed bag labelled with accompanying specific documentation indicating that the product is genetically modified maize YieldGard® maize?

O Yes O No

Did you comply with the label recommendations on seed bags?

O Yes
O No, because:____

____
____
____

4.3 Prevention of insect resistance

Did you plant a refuge in accordance to the technical guidelines?

O Yes
O No, because the surface of YieldGard® maize planted on the farm is < 5 ha
O No, because ____

____
____
____