Appendix 1. Post Market Monitoring of insect protected *Bt* maize MON 810 in Europe – Conclusions of a survey with Farmer Questionnaires in 2015

APPLIED STATISTICS AND INFORMATICS
IN LIFE SCIENCES

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

Biometrical annual Report on the 2015 growing season

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

Contents

List of abbreviations

GM	genetically modified
GMO	genetically modified organism
GMP	genetically modified plant
PMEM	post-market environmental monitoring

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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 [OJEC, 2001]. Monitoring is supposed 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 (ERA) is correct and to identify any adverse effect of the GMO and its use on human health or the environment which were not anticipated in the ERA. 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 in Europe's major MON 810 cultivating countries Spain and Portugal in 2015. The questionnaires have been completed between December 2015 and February 2016. In the 2015 growing season 261 farmers have been surveyed.

2015 data indicate that in comparison to conventional maize plants, MON 810 plants

- received less insecticides caused by their inherent protection against certain lepidopteran pests,
- germinated more vigourously caused by 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 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.

The identified deviations were 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.

1 Introduction

According to Annex VII of Directive 2001/18/EC [OJEC, 2001] of the European Parliament and of the Council on the deliberate release into the environment of genetically modified plants (GMP), 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 (ERA) is correct, and
- identify the occurrence of adverse effects of the GMO or its use on human or animal health, or the environment, which were not anticipated in the ERA.

Upon approval of MON 810 (Commission Decision 98/294/EC [OJEC, 1998]), 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 about the results. These results on insect resistance monitoring, however, are not part of the current report.

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

The objective of this biometrical report is to present the rationale behind the farm questionnaire approach and the analysis of the farm questionnaire results from the 2015 planting season. The questionnaire approach was applied for the first time in 2006. The format of the questionnaire is reviewed on a yearly basis based on the outcome of the latest survey.

2 Methodology

2.1 Tool for General Surveillance: the farm questionnaire

2.1.1 Structure of the farm questionnaire

Based on commonly defined protection goals, such as soil function, plant health and sustainable agriculture together with derived areas of potential impact on these protection goals, a range of relevant monitoring characters for MON 810 GS has been identified (Table 1). These monitoring characters might be influenced by the cultivation of MON 810, but in an agricultural landscape other influencing factors (Table 3) exist which need to be taken into account and they are therefore monitored as well.

For that purpose, a farm questionnaire was designed to obtain data on monitoring characters and influencing factors (see Appendix B). Any unusual observations in monitoring characters would lead to an assessment of the collected information in order to determine whether the unusal observation is attributable to changes in influencing factors or the genetic modification. Farmers record a range of agronomic information and are the most frequent and consistent observers of crops and fields (*e.g.* by collection of field-specific records of seeds, tilling methods, physical and chemical soil analysis, fertilizer application, crop protection measures, yields and quality). Additionally, farmers hold in "farm files", which are 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 Centre for Agriculture and Forestry (BBA, now JKI), maize breeders and statisticians in Germany [Wilhelm, 2004]. Its questions were developed in order to be to be easily understood, not to be too burdensome and to be sufficiently pragmatic to take into account real commercial situations.

The questionnaire approach was tested in a pilot survey in 2005. Based on that survey an adapted version of the questionnaire was created and applied for the first time in 2006. 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 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 the 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 usual 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. Therefore, most questions are formulated to identify deviation from the situation with conventional maize. Farmers are asked to assess the situation in comparison to conventional cultivation. If a farmer assesses the situation to be different, he is additionally asked to specify the direction of the difference; hence the category $Different$ is divided into two subcategories. To simplify this two-stage procedure in the questionnaire for most questions, three possible categories of answers are given: $As\ usual$, $Plus$ (*e.g.* later, higher, more) and $Minus$ (*e.g.* earlier, lower or less). Thus, a rather high frequency (> 10 %) of $Plus$- or $Minus$- answers would indicate possible effects (see Section 2.4).

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

2.1.2 Coding of personal data

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

2	0	1	5	-	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	...
Partner:	MON	Monsanto
	MAR	Markin
	AGR	Agro.Ges
	...	...
Country:	ES	Spain
	PT	Portugal
	...	...
Interviewer:	01	A
	02	B
	03	...
Farmer:	farmer's ID within the interviewer	
Area:	incremental counter within the farmer	

(*e.g.* 2015-01-MAR-ES-01-01-01).

The data were stored and handled in accordance with the Data Protection Directive 95/46/EC [OJEC, 1995]. This is in order to ensure an honest response and to avoid competitive intelligence.

2.1.3 Training of interviewers

To assist the interviewers in filling out the questionnaires with the farmers, a 'user's manual' was developed. While questions have been carefully phrased to obtain accurate observations from farmers, preceding experience with the questionnaire may increase awareness.

Additionally, like in previous years, 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 1 provides an overview on the monitored characters and the protection goals that are addressed by them.

Table 1: Monitoring characters and corresponding protection goals

Monitoring characters	**Protection goals**
Crop rotation	Sustainable agriculture, plant health
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
Fertiliser application	Sustainable agriculture, soil function
Irrigation practices	Sustainable agriculture
Time of harvest	Sustainable agriculture, plant health
Germination vigour	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	Plant health, sustainable agriculture, biodiversity
Insect pest control (*Ostrinia nubilalis*)	Plant health, sustainable agriculture
Insect pest control (*Sesamia* spp.)	Plant health, sustainable agriculture
Pest susceptibility	Sustainable agriculture, plant health, biodiversity
Weed pressure	Sustainable agriculture, soil function, biodiversity
Occurrence of insects	Biodiversity
Occurrence of birds	Biodiversity
Occurrence of mammals	Biodiversity
Performance of fed animals	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. The farmer is asked to specify the conventional variety/ies he is cultivating on his farm to then use it/them as comparator(s). The farmers additionally use their general experience of cultivating conventional maize, thereby especially assessing the seasonal specifics. Farmers usually know whether observed differences are based on *e.g.* different varieties' maturity groups. For most questions, the possible categories of answers $As\ usual$ and $Different$, with the latter category subdivided into $Plus$ (*e.g.* later, higher, more) or $Minus$ (*e.g.* earlier, lower or less) were given (see Table 2).

Table 2: Monitoring characters and their categories

	Monitoring characters – observations of MON 810	*As usual*	*Different Minus*	*Different Plus*
Agronomic practices	Crop rotation	as usual	-	changed
	Time of planting	as usual	earlier	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
	Fertiliser application	as usual	-	changed
	Irrigation practices	as usual	-	changed
	Time of harvest	as usual	earlier	later
Characteristics in the field	Germination vigour	as usual	less	more
	Time to emergence	as usual	accelerated	delayed
	Time to male flowering	as usual	accelerated	delayed
	Plant growth and development	as usual	accelerated	delayed
	Incidence of stalk/root lodging	as usual	less	more
	Time to maturity	as usual	accelerated	delayed
	Yield	as usual	lower	higher
	Occurrence of MON 810 volunteers	as usual	less	more
Einvironment and wildlife	Disease susceptibility	as usual	less	more
	Insect pest control (*Ostrinia nubilalis*)	good	weak	very good
	Insect pest control (*Sesamia* spp.)	good	weak	very good
	Pest susceptibility	as usual	less	more
	Weed pressure	as usual	less	more
	Occurrence of insects	as usual	less	more
	Occurrence of birds	as usual	less	more
	Occurrence of mammals	as usual	less	more
	Performance of fed animals	as usual	-	changed

2.3 Definition of influencing factors

Besides named monitoring characters, several potentially influencing factors were surveyed to assess the local conditions and to determine the cause of potential effects in the monitoring characters (Table 3).

Table 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 is well formulated and unambiguous - one would expect a predominant part of the farmers assessing the situation to be $As\ usual$. 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 1). Therefore, the ***baseline*** for the analysis of monitoring characters with categories *As usual* and *Different* is 90 % - 10 %, where $Minus$- and $Plus$-answers are balanced and both about 5 %.

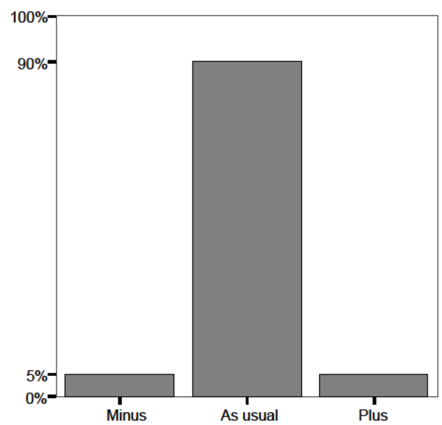

Figure 1: Balanced (expected) baseline distribution of the farmers' answers (no effect)

An effect of the cultivation of MON 810 or any other influencing factor would arise in a greater percentage of $Different$ (*i.e.* $Plus$ - or $Minus$-) answers, where "greater" or an ***effect***, was quantitatively defined by exceeding a threshold of 10 % (Figure 2(a) and (b)). Graphically, an effect would be expressed by an unbalanced distribution (Figure 3(a) and (b)).

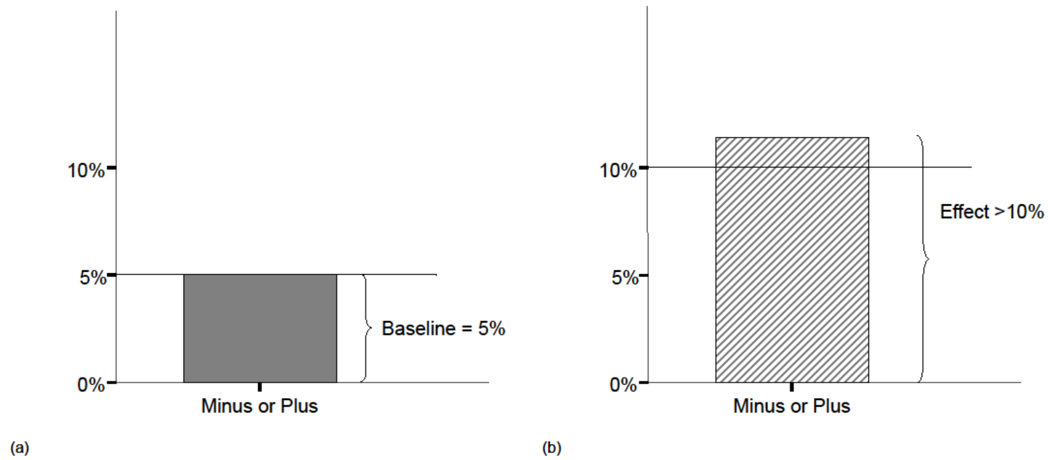

Figure 2: Definition of (a) baseline and (b) effect

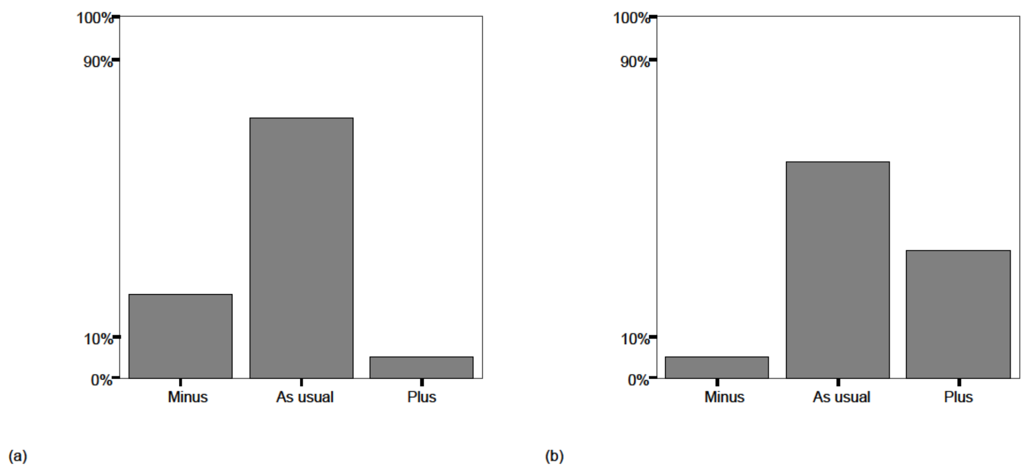

Figure 3: Examples for distributions of farmers' answers indicating an effect (a) > 10 % in category $Minus$ → effect, (b) > 10 % in category $Plus$ → effect

The categories *As usual*, *Plus* and *Minus* form a vector with a multinomial distribution

$$(Minus, As\ usual, Plus) \sim Mult(n; p_{Minus}, p_{As\ usual}, p_{Plus})$$

Therefore, each component of this vector is binomially distributed

$$Minus \sim B(n, p_{Minus}, k),\ \ As\ usual \sim B(n, p_{As\ usual}, k),\ \ Plus \sim B(n, p_{Plus}, k)$$

To detect an effect of MON810 cultivation, the following statistical hypothesis are formulated:

$$H_0^1 : p_{As\ usual} \leq 0.9 \quad \text{vs. } H_A^1 : p_{As\ usual} > 0.9$$

$H_0^2 : p_{Minus} \geq 0.1$ vs. $H_A^2 : p_{Minus} < 0.1$

$H_0^3 : p_{Plus} \geq 0.1$ vs. $H_A^3 : p_{Plus} < 0.1$

The set of null hypothesis $\{H_0^1, H_0^2, H_0^3\}$ is closed under intersection because

$H_0^1 \cap H_0^2 = [0,0.9] \cap [0.1,1] = [0.1,0.9] \in [0,1] = \{H_0^1, H_0^2, H_0^3\}$ and

$H_0^1 \cap H_0^3 = [0,0.9] \cap [0.1,1] = [0.1,0.9] \in [0,1] = \{H_0^1, H_0^2, H_0^3\}$ and

$H_0^2 \cap H_0^3 = [0.1,1] \cap [0.1,1] = [0.1,1] \in [0,1] = \{H_0^1, H_0^2, H_0^3\}$.

The detection of an effect is made in two steps. First, the global null hypothesis $H_0^1 : p_{As\ usual} \leq 0.9$ is tested. If this hypothesis is rejected, testing of the hypotheses H_0^2 and H_0^3 is not needed anymore since they will be rejected then, too. Secondly, if $H_0^1 : p_{As\ usual} \leq 0.9$ is not rejected, the hypotheses H_0^2 and H_0^3 are to be tested. The test procedure is displayed in Figure 4.

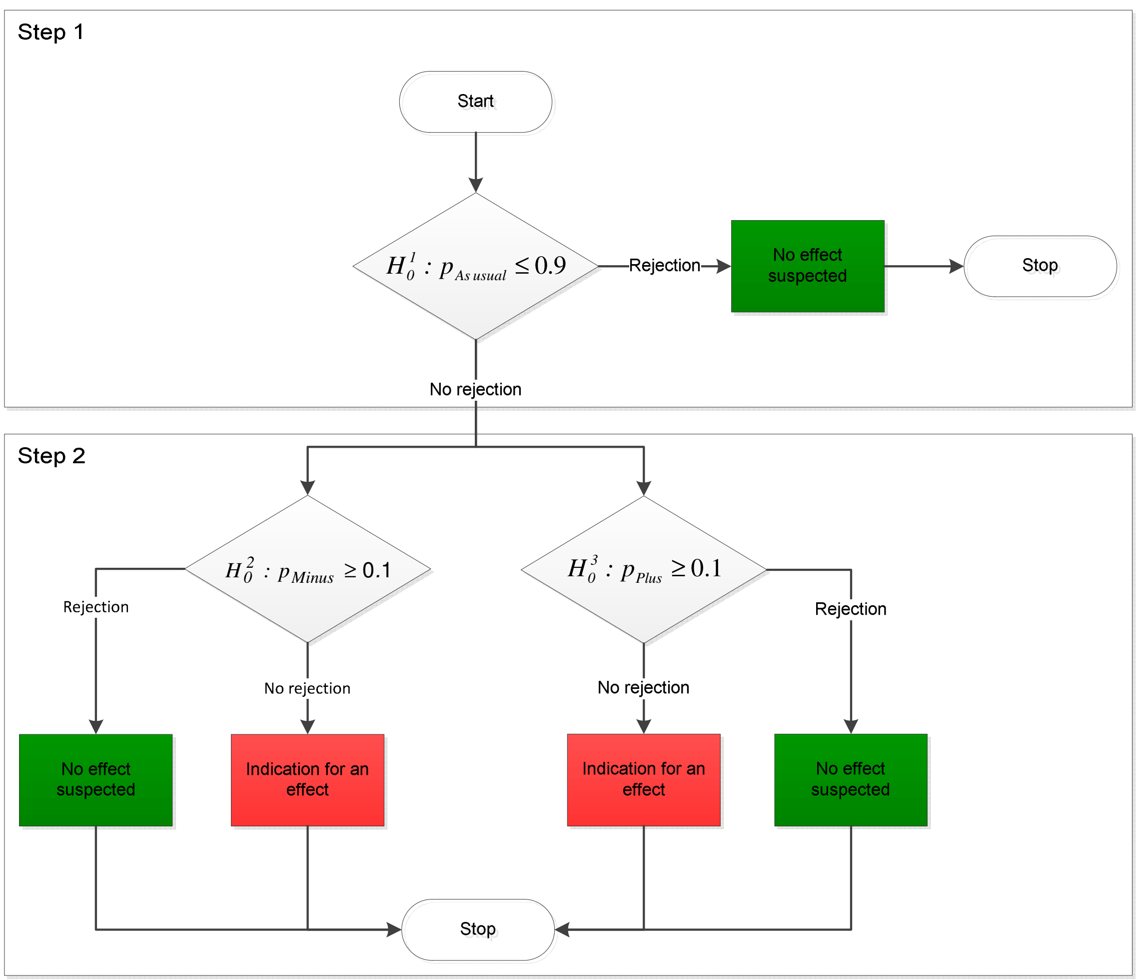

Figure 4: Closed test procedure for the three probabilities of *As usual*, *Plus*- and *Minus*-answers

This test procedure is coherent because a rejection of the null hypothesis in step 1 implies a rejection of the hypotheses in step 2. The test procedure is called a closed test procedure.

Within the closed test principle, hypotheses are tested by applying the exact binomial test.

- Step (1): Test of the probability $p_{As\ usual}$ (usually the largest probability)
  Null hypothesis: GMP cultivation has an effect, the probability of getting $As\ usual$ -answers is smaller than 90 % (H_0: $p_{As\ usual} \leq 0.9$)
- Step (2): Test of the p_{Minus} probabilities and p_{Plus} probabilities
  Null hypothesis: GMP cultivation has an effect, the probability of getting $Minus$- or $Plus$-answers is larger than 10 % (H_0: $p_{Minus} \geq 0.1$, H_0: $p_{Plus} \geq 0.1$)

This closed test procedure controls for the experiment-wise error rate because an erroneous decision, *i.e.* an error of the first kind (rejection of the null hypothesis although it is true) during the whole procedure can only be done once: an erroneous rejection of the null hypothesis (1) (*i.e.* in reality $p_{As\ usual} \leq 0.9$) corresponds to an erroneous rejection of the null hypotheses (2) (*i.e.* in reality $p_{Plus} \geq 0.1$ or $p_{Minus} \geq 0.1$) [Marcus, 1976], [Maurer, 1995].

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

1. The frequencies of the farmer responses 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, answers are accounted as missing values and therefore not considered valid. As a consequence, the "valid percentages" state the proportions of actually known answers, 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 to illustrate the distribution function and for quality control reasons.
2. The frequencies of $As\ usual$-, $Plus$- and $Minus$-answers are statistically tested according to the closed principle test procedure as described above (in case of questions that allow for only two answers like *e.g. Crop Rotation's* “as usual”/”changed”, only $As\ usual$- and $Plus$-answer frequencies are tested accordingly).
   The resulting P-values are compared to a level of significance $\alpha = 0.01$. If the P-value is smaller than $\alpha = 0.01$, the corresponding null hypothesis is rejected. If the P-value is larger than $\alpha = 0.01$, respective hypothesis cannot be rejected.
   - In case Hypothesis (1) with $p_{As\ usual} \leq 0.9$ is rejected, no effect is indicated.
   - In case Hypothesis (1) with $p_{As\ usual} \leq 0.9$ cannot be rejected, but both hypotheses (2) with $p_{Minus} \geq 0.1$ and $p_{Plus} \geq 0.1$ can be rejected, no effect is indicated.
   - In case Hypothesis (1) with $p_{As\ usual} \leq 0.9$ cannot be rejected and at least one of the hypotheses (2) cannot be rejected either, an effect is indicated.

   (See Figure 4 for a flow chart of the above named decision making processes.)

3. Where an effect is indicated, the effect must be interpreted (adverse/beneficial).
4. Where an adverse effect is identified, the cause of the effect must be ascertained (MON 810 cultivation or other influencing factors).
5. Identification of adverse effects potentially caused by MON 810 cultivation would require further examinations. Such cases, however, have neither been found in this years', nor in previous years' data.

Subsequently, 99 % confidence intervals are calculated for the $p_{As\ usual}$, p_{Minus} and p_{Plus} . The probabilities of $As\ usual$, $Plus$- and $Minus$- answers with corresponding confidence intervals are illustrated graphically.

2.5 Sample size determination and selection

The sample size determination of the survey was based on the exact binomial test. It depends on the threshold for the test, the error of the first kind α, the error of the second kind β and the effect size d [Rasch, 2007a].

The error of the first kind is the probability to reject the null hypothesis although it is true, *i.e.* not to identify an existing effect. This probability should be as small as possible since it is the aim of GS to identify any existing effects. The error of the first kind is also called consumer's risk.

The error of the second kind is the probability to accept the null hypothesis although it is false, *i.e.* to identify an effect although none exists. This probability should also be as small as possible as it would raise false alarm (Table 4). The error of the second kind is also called producer's risk.

The magnitude of the effect size d was chosen from experience in analyzing farm questionnaires in a pilot study in Germany 2001 - 2005 [Schmidt, 2008].

Table 4: Error of the first kind α and error of the second kind β for the test decision in testing frequencies of $Plus$- or $Minus$-answers from farm questionnaires against the threshold of 10 %

		Real situation	
		$p \leq 0.9$ **Indication for an effect**	$p > 0.9$ **No effect**
Test decision	**Acceptance** $H_0 : p \leq 0.9$	Correct decision with Probability $1 - \alpha = 99\,\%$	Wrong decision with Probability $\beta = 1\,\%$
	Rejection $H_0 : p \leq 0.9$	Wrong decision with Probability $\alpha = 1\,\%$	Correct decision with Probability $1 - \beta = 99\,\% = POWER$

CADEMO light [Cademo, 2006] was used as proposed by [Rasch, 2007a] to determine the sample size for a binomial test (Method 3/62/1005). Within this survey the accuracy demands $p = 0.9$ (threshold for adverse effects to be tested: 90 % of $As\ usual$ -answers, $\alpha = 0.01$ (error of the first kind), $\beta = 0.01$ (error of the second kind), and $d = 3\,\%$ (effect size) should be met. Under these demands for a one sample problem, testing a probability against a threshold with a one-sided test, a sample size of 2 436 questionnaires was calculated. To get this sample size even in the case of questionnaires having to be excluded from the survey *e.g.* because of low quality, this number was rounded to 2 500 questionnaires.

Since the monitoring objects are fields where genetically modified crops are cultivated, the total population consists of all fields within the EU being cultivated within the 10-years authorization period. From this population a maximum of 2 500 fields has to be selected for the GS survey. Sampling of these 2 500 fields should ensure to reflect the range and distribution of plant production systems and environments exposed to GMP cultivation. This range is on one hand characterized by the growing season (year and its climatic, environmental conditions), while on the other hand, it is characterized by the geographic regions where GM cultivation takes place. Regions may vary in terms of their production systems, regulatory requirements, agro-political and socio-economic conditions and therefore are best described by European countries. Consequently, sampling takes place within strata (defined by years and countries of cultivation).

The total number of 2 500 monitoring objects is firstly equally subdivided into 250 objects per year. It is then tried to consider the fluctuant adoption of the GMP (grade of market maturity) by assigning these 250 objects to the respective countries on a yearly basis. If fewer than 250 fields per year are cultivated, the maximum possible number of monitoring objects is surveyed. In a second step, a quota considering

- the countries of MON810 cultivation in the respective year,
- the magnitude of MON 810 cultivation (ha planted per country/ ha planted in the EU) and
- local situation (average field size in the country)

is applied. Furthermore, it is tried to consider the fluctuant adoption of the GMP (grade of market maturity) by assigning the 250 objects per year to the respective countries (second stratum). Consequently, the sample cultivation areas with a high uptake of the GMP may be over-represented by a large number of monitored fields, while as countries with proportionally very low cultivation may be excluded from the monitoring.

In reality, the sampling procedure is afflicted by several challenges:

- the total population of interest, i.e. the total number of fields (and the field sizes) is not known,
- the development of areas of MON810 cultivation cannot be predicted,
- for the definition of the yearly sampling frame, not the total number of fields but only the total cultivated area (in ha, see Table 7) is known.

Therefore the sampling frame for this survey cannot be based on the total population of fields with MON 810 cultivation in Europe. Instead, a quota considering the magnitude (ha planted per country/ ha planted in the EU) and product situation (average field size in the country) of MON 810 cultivation is applied, resulting in an estimation for the optimal number of farmers to be monitored per year and country.

Within each stratum (per year and country) the determined number of monitoring units needs to be selected. For data survey, the contact details of the cultivating farmers needs to be identified. GMO cultivation register information - where publicly available - is used to identify the regions of cultivation. It cannot not be used to identify the cultivating farmers since in most countries the personal data of farmers are not freely available. Farmers therefore are selected from customer lists of the seed selling companies or interviewer companies, plus experience from previous surveys or search in the region. When buying the seeds, farmers are informed to possibly be contacted for a GS survey. All farmer refusals are recorded.

The whole sampling procedure ensures that the monitoring area will be proportional to and representative of the total regional area under GM cultivation.

2.6 Power of the Test

The power of the test $p_{Minus} \geq 0.1$, $p_{Plus} \geq 0.1$, respectively is the probability to reject the null hypothesis of an effect where none exists (correct decision). It is defined as $1 - \beta$ (β = error of the second kind) and is calculated as followed:

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

where:

$F_u = \min_F(P(F \leq F_E | H_0) > \alpha$

$p =$ given probability of $Plus$- or $Minus$ -answers for which the power is calculates

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

Figure 5 illustrates the power for an alternative hypothesis value of 0.13 (effect size 0.03). The distribution of the null hypothesis value (0.10) is represented by the red curve; the distribution of the alternative hypothesis value (0.13) is represented by the blue curve. The green line shows the critical value for an error probability $\alpha = 0.01$. If the alternative hypothesis is actually true (GM cultivation has no effect) the rejection of the null hypothesis is a correct decision which will occur with 99 % probability (under the blue curve to the left of the green line), *i.e.* with a power of 99 %.

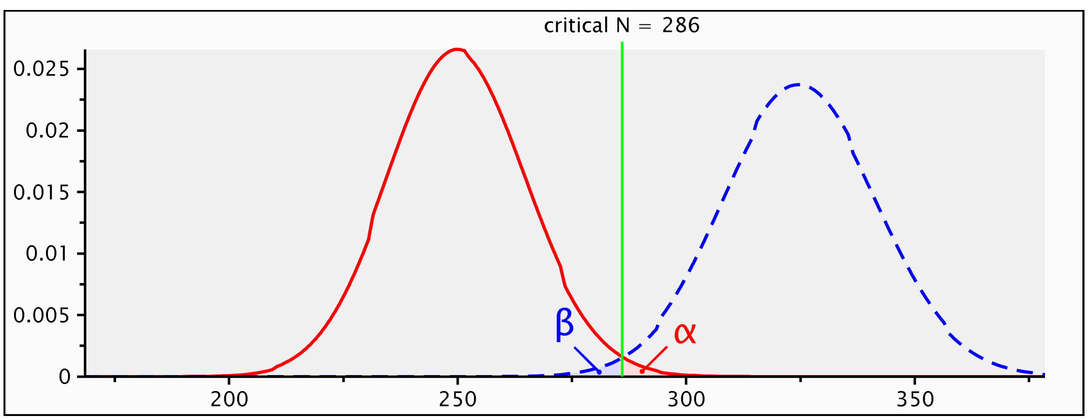

Figure 5: Null ($p = 0.1$) and alternative ($p = 0.13$) binomial distribution functions for a sample size of 2 500 type I and type II errors α and β both 0.01 (graph: G*Power Version 3.1.6)

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 farmers were asked for clarification. Afterwards, 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.* $As\ usual/Plus/\ Minus$) were defined and coded (and only the coded values taken).

High quality of the data is assured by preliminarily training the interviewers in a workshop via phone on a yearly basis. In face-to-face interviews, the interviewers are instructed to check whether the farmer`s answer corresponds to their documentation. When surveys are performed by phone, the farmers receive the questionnaire about two weeks in advance to pick up the information from their documentation. In 2015, all interviews were conducted face-to-face.

All data are entered and controlled for their quality and plausibility. A quality control check first verifies the completeness of the data. Some data fields (especially the monitoring characters or comments in case the farmer's assessments differ from $As\ usual$) are defined to be mandatory, therefore missing values or unreadable entries are not accepted. Furthermore, the values are verified for correctness (quantitative values within a plausible min-max range, qualitative values meeting only acceptable values). A plausibility control validates the variable values for their contents, both to identify incorrect answers and to prove the logical connections between different questions. It also looks 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.

For any missing or implausible data the interviewers are asked to contact the farmers again to complete or correct the questionnaire (in these cases interviewers receive corresponding queries from BioMath).

3 Results

The questionnaires have been completed between December 2015 and February 2016. In the 2015 growing season 261 farm questionnaires have been collected. Quality and plausibility control confirmed that all 261 questionnaires could be considered for analysis. This good quality also resulted from the interviewer training.

The analysis shows that in most cases, the frequencies for the three categories of the monitoring characters show the expected balanced distribution. In some cases, deviations were identified.

An overview of numbers, percentages and levels of significance for the binomial tests of the data in 2015 is given in Table 5. The fields in the table highlighted in grey mark the cases for which the test against the 0.9/ 0.1 thresholds resulted in P-values greater than or equal to 0.01, so the null hypotheses (that these values are smaller than 0.9 or greater than 0.1, respectively) could not be rejected and therefore indicate the occurrence of an effect.

Table 6 lists the probabilities of $As\ usual$, $Plus$-/ $Minus$ - answers for the monitoring characters together with corresponding 99 % confidence intervals. All probabilities with confidence intervals are shown on the same graph (for each of the $As\ usual/Plus/\ Minus$ - answers) in Figure 6, thereby forming an overall pattern and allowing the assessment of MON 810 effects at one glance. The vertical dashed lines indicate the test thresholds of 0.9/ 0.1 (biological relevance).

No effect of MON 810 is indicated if

- for the $As\ usual$ probabilty the lower confidence bound is greater than the threshold of 0.9, *i.e.* the whole confidence interval lies on the right side of the dashed line or

An effect of MON 810 is indicated if

- for the $As\ usual$ probabilty the threshold lies between the lower and upper confidence bounds, *i.e.* the confidence interval crosses the dashed line.
- for the $As\ usual$ probabilty the upper confidence bound is smaller than the threshold, *i.e.* the whole confidence interval lies on the left side of the dashed line.

Table 5: Overview on the results of the closed test procedure for the monitoring characters in 2015

Monitoring character	N valid	*As usual*	P for $p_0 = 0.9$	*Minus*	P for $p_0 = 0.1$	*Plus*	P for $p_0 = 0.1$
Crop rotation	261	244 (93.5 %)	0.019			17 (6.5 %)	0.032
Time of planting	261	243 (93.1 %)	0.032	1 (0.4 %)	< 0.01	17 (6.5 %)	0.032
Tillage and planting technique	260	251 (96.5 %)	< 0.01				
Insect control practices	261	223 (85.4 %)	0.988			38 (14.6 %)	1.0
Weed control practices	261	261 (100.0 %)	< 0.01				
Fungal control practices	261	261 (100.0 %)	< 0.01				
Maize borer control practice	260	223 (85.8 %)	0.981			37 (14.2 %)	0.988
Fertilizer application	261	261 (100.0 %)	< 0.01				
Irrigation practices	261	261 (100.0 %)	< 0.01				
Time of harvest	260	249 (95.8 %)	< 0.01				
Germination vigor	261	227 (87.0 %)	0.933	0 (0.0 %)	< 0.01	34 (13.0 %)	0.954
Time to emergence	261	260 (99.6 %)	< 0.01				
Time to male flowering	261	261 (100.0 %)	< 0.01				
Plant growth and development	261	257 (98.5 %)	< 0.01				
Incidence of stalk / root lodging	261	190 (72.8 %)	1.0	71 (27.2 %)	1.0	0 (0.0 %)	< 0.01
Time to maturity	261	245 (93.9 %)	0.010	0 (0.0 %)	< 0.01	16 (6.1 %)	0,019
Yield	261	129 (49.4 %)	1.0	0 (0.0 %)	< 0.01	132 (50.6 %)	1.0
Occurrence of volunteers	261	250 (95.8 %)	< 0.01				
Disease susceptibility	261	250 (95.8 %)	< 0.01				
Pest susceptibility	261	204 (78.2 %)	1.0	57 (21.8 %)	1.0	0 (0.0 %)	< 0.01
Weed pressure	261	261 (100.0 %)	< 0.01				
Occurrence of insects	261	260 (99.6 %)	< 0.01				
Occurrence of birds	261	260 (99.6 %)	< 0.01				
Occurrence of mammals	261	260 (99.6 %)	< 0.01				
Performance of animals	14	14 (100.0 %)	< 0.01				

For grey highlighted probability values the binomial test against the threshold of 90 % for $As\ usual$-answers or 10 % for $Minus$ - or $Plus$-answers, respectively, resulted in p-values greater than $\alpha = 0.01$, so the null hypotheses, that these values are smaller than 90 % for $As\ usual$-answers or greater than 10 % for $Minus$ - or $Plus$-answers, respectively, could not be rejected, *i.e.* an effect is indicated.

Table 6: Overview on the $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of the monitoring characters and corresponding 99 % confidence intervals

Monitoring character	$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
Crop rotation	93.5%	89.6%	97.4%	-	-	-	6.5%	2.6%	10.4%
Time of planting	93.1%	89.1%	97.1%	0.4%	0.0%	1.4%	6.5%	2.6%	10.4%
Tillage and planting technique	96.5%	93.6%	99.5%	-	-	-	3.5%	0.5%	6.4%
Insect control practices	85.4%	79.8%	91.1%	-	-	-	14.6%	8.9%	20.2%
Weed control practices	100.0%	100.0%	100.0%	-	-	-	0.0%	0.0%	0.0%
Fungal control practices	100.0%	100.0%	100.0%	-	-	-	0.0%	0.0%	0.0%
Maize Borer control practice	85.8%	80.2%	91.4%	-	-	-	14.2%	8.6%	19.8%
Fertilizer Application	100.0%	100.0%	100.0%	-	-	-	0.0%	0.0%	0.0%
Irrigation Practices	100.0%	100.0%	100.0%	-	-	-	0.0%	0.0%	0.0%
Time of harvest	95.8%	92.6%	99.0%	0.0%	0.0%	0.0%	4.2%	1.0%	7.4%
Germination vigor	87.0%	81.6%	92.3%	0.0%	0.0%	0.0%	13.0%	7.7%	18.4%
Time to emergence	99.6%	98.6%	100.6%	0.4%	0.0%	1.4%	0.0%	0.0%	0.0%
Time to male flowering	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plant growth and development	98.5%	96.5%	100.4%	1.1%	0.0%	2.8%	0.4%	0.0%	1.4%
Incidence of stalk / root lodging	72.8%	65.7%	79.9%	27.2%	20.1%	34.3%	0.0%	0.0%	0.0%
Time to maturity	93.9%	90.0%	97.7%	0.0%	0.0%	0.0%	6.1%	2.3%	10.0%
Yield	49.4%	41.5%	57.4%	0.0%	0.0%	0.0%	50.6%	42.6%	58.5%
Occurrence of volunteers	95.8%	92.6%	99.0%	3.8%	0.8%	6.9%	0.4%	0.0%	1.4%
Disease susceptibility	95.8%	92.6%	99.0%	4.2%	1.0%	7.4%	0.0%	0.0%	0.0%
Pest susceptibility	78.2%	71.6%	84.7%	21.8%	15.3%	28.4%	0.0%	0.0%	0.0%
Weed pressure	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Occurrence of insects	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Occurrence of birds	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Occurrence of mamals	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Performance of animals	100.0%	100.0%	100.0%	-	-	-	0.0%	0.0%	0.0%

Grey highlighted confidence intervals cross the threshold of 90 % for *As usual*-answers or 10 % for *Minus* - or *Plus*-answers, respectively, so the null hypotheses, that these values are smaller than 90 % for *As usual*-answers or greater than 10 % for *Minus* - or *Plus*-answers, respectively, could not be rejected, *i.e.* an effect is indicated.

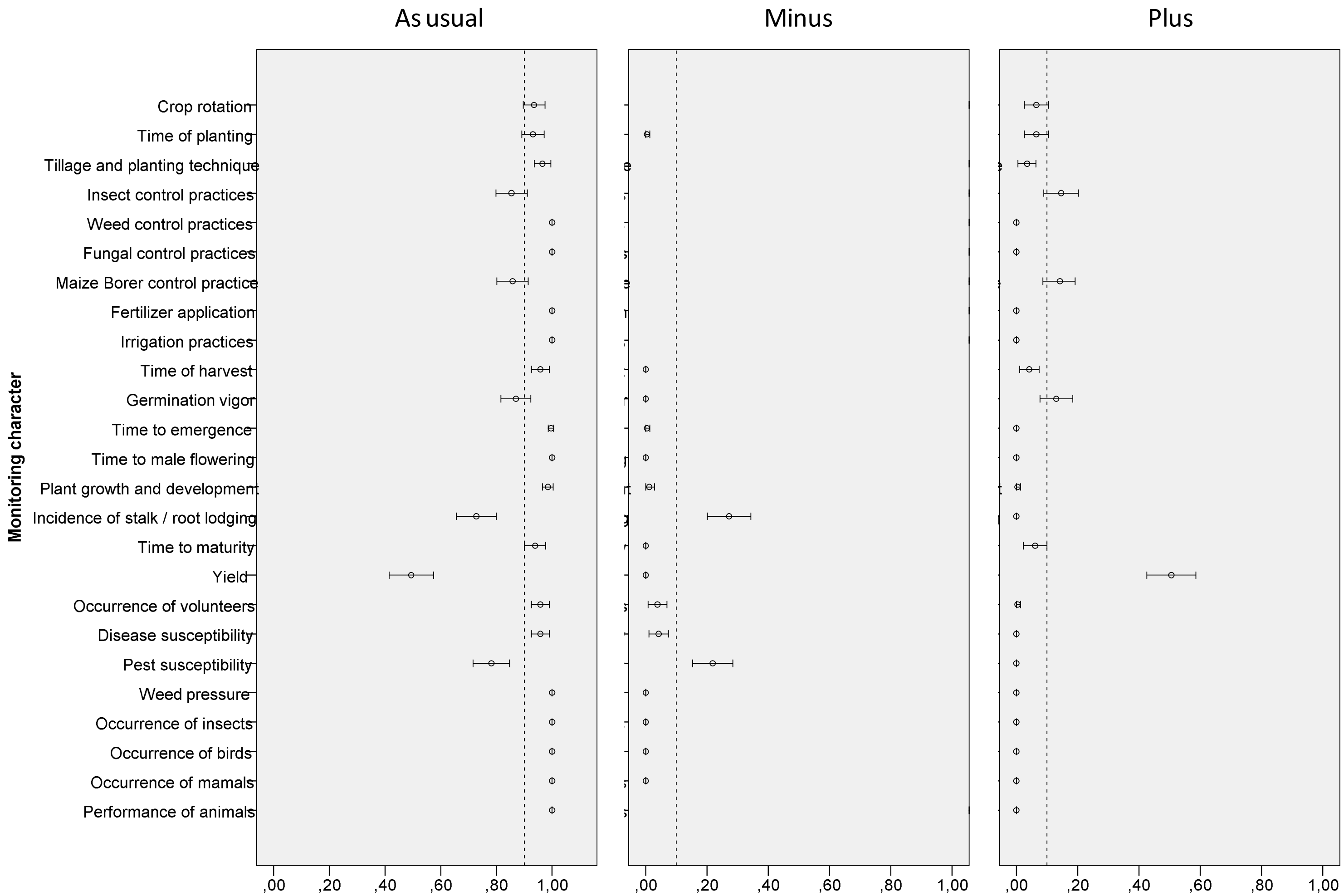

Figure 6: $As\ usual$- , $Plus$- and $Minus$ - answer probabilities of all monitoring characters, point estimates (circle) and 99 % confidence intervals (bars). Vertical dashed line indicates the test thresholds of 0.9 or 0.1, respectively (biological relevance)

Taken together, 2015 data indicate that in comparison to conventional maize, MON 810 plants

- received less insecticides,
- germinated more vigourously,
- had less incidence of stalk/root lodging,
- had a longer time to maturity,
- gave a higher yield,
- were less susceptible to pests other than corn borers, especially lepidopteran pests.

In the following sections the detailed analysis of all parameters surveyed using the questionnaire in 2015 is described and the results are assessed scientifically.

3.1 Sampling and quality and plausibility control

The questionnaires have been completed between December 2015 and February 2016. In the 2015 growing season 261 farm questionnaires have been collected.

In Spain, the largest market, the surveys (212) were performed by Instituto Markin, SL[2], in Portugal the surveys (49) were performed by Agro.Ges - Sociedade de Estudos e Projectos[3]. These companies have an established experience in agricultural surveys.

In Spain, 21 farmers of the contacted farmers refused to participate in the survey (they did not grow maize/ YieldGard in 2015, did not want to participate, did not want to sign Consent Form, were sick or retired), whereas in Portugal none of the contacted farmers did. Alltogether from 282 contacted farmers, 261 took part in the survey. Therefore, the minimum sample size of 250 again was surpassed.

After the first quality and plausibility control, 20 inconsistencies occurred in the questionnaires (one from Spain, 19 from Portugal): 2 cases of missing entries, 9 inconsistencies (translation errors) and 9 incorrect pesticide/ variety names. After including the corrections, the quality and plausibility control confirmed that all 261 questionnaires could be considered for analysis.

The high quality of the questionnaires can also be ascribed to the interviewer training.

The database currently contains 2 627 cases (questionnaires) for 10 field seasons: 252 for 2006, 291 for 2007, 297 for 2008, 240 for 2009, 271 for 2010, 249 for 2011, 249 for 2012, 256 for 2013, 261 for 2014 and 261 for 2015.

[2] Instituto Markin, SL; c/ Caleruega, 60 4º D -28033 Madrid -Spain
[3] Agro.Ges -Sociedade de Estudos e Projectos, Av. da República, 412, 2750-475 Cascais -Portugal

3.2 Part 1: Maize grown area

3.2.1 Location

In 2015, 261 questionnaires were surveyed in the cultivation areas of MON 810 in Spain and Portugal. With an area of 107 749 ha in Spain and 8 017 ha in Portugal, these two countries represent Europes largest MON 810 cultivators. Of these areas, 5.1 % and 40.5 % were monitored in this study for Spain and Portugal, respectively (Table 7).

Figure 7 shows a geographical overview on the cultivation areas of MON 810 in Europe in 2015 (dark grey areas) and the location of the monitoring sites (numbers).

Table 7: MON 810 cultivation and monitored areas in 2015

Country	Total planted MON 810 area (ha)	Monitored MON 810 area (ha)	Monitored MON 810 area / total planted MON 810 area (%)
Spain	107 749	5 466	5.1
Portugal	8 017	3 251	40.5
Czech Republic	997	0	0.0
Slovakia	104	0	0.0
Total	116 867	8 716	7.5

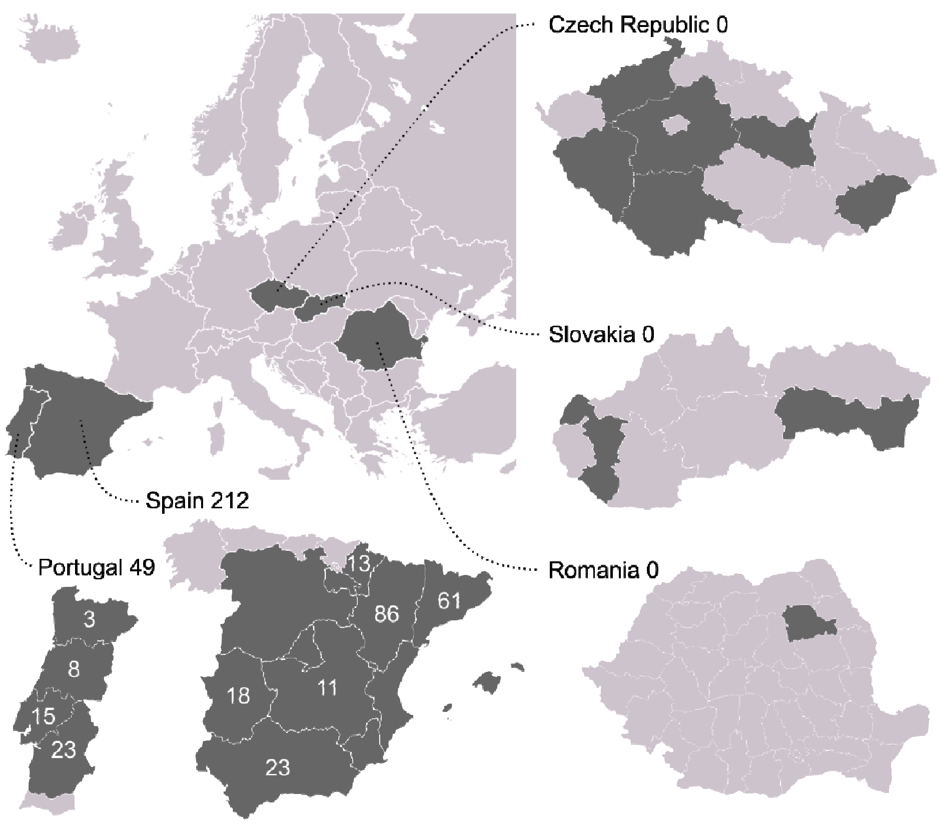

Figure 7: Number of sampling sites within the cultivation areas (dark grey) of MON 810 in Europe in 2015

3.2.2 Surrounding environment

The farmers were asked to describe the land usage in the surrounding of the areas planted with maize. All but one field (99.6 %) are surrounded by farmland while a single field (0.4 %) is surrounded by other types of environment (Table 8, Figure 8).

Table 8: Land usage in the surrounding of the areas planted with MON 810 in Europe in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	Farmland	260	99.6	99.6	99.6
	Forest or wild habitat	1	0.4	0.4	100.0
Total		261	100.0	100.0	

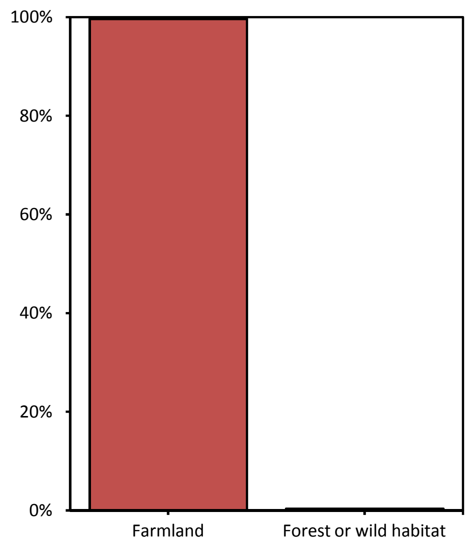

Figure 8: Land usage in the surrounding of the areas planted with MON 810 in Europe in 2015

3.2.3 Size and number of fields of the maize cultivated area

The size of the total maize area at the farms in 2015 ranged from 1.0 to 728.0 hectares. The average MON 810 areas per surveyed farmer in 2015 were 25.8 ha in Spain and 66.3 ha in Portugal. Details for cultivation of maize between 2006 and 2015 divided by country can be found in Table 9, Table 10 and Table 11.

Table 9: 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 Republic	all maize	424.6	52.0	2,500.0	433.8	89.3	1,400.0	431.9	57.4	3,000.0	338.9	8.4	789.1
	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	1,300.0	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	1,110.0	239.5	20.0	1,130.0	256.1	4.8	1,470.0	-	-	-
	MON 810	17.3	1.0	50.0	43.0	0.5	166.0	51.6	0.2	200.0	-	-	-
Romania	all maize	-	-	-	1,969.8	253.0	5,616.0	591.4	5.4	6,789.0	417.5	2.5	6,869.0
	MON 810	-	-	-	61.4	0.5	216.0	149.0	2.0	2,705.0	62.1	1.0	1,114.0
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

Table 10: Maize area (ha) per surveyed farmer in 2010, 2011 and 2012

		2010			2011			2012		
Country	**Total Area (ha)**	**Mean**	**Min**	**Max**	**Mean**	**Min**	**Mean**	**Min**	**Mean**	**Min**
Spain	all maize	34.2	2.0	34.2	2.0	34.2	2.0	33.0	1.0	320.0
	MON 810	23.9	1.0	23.9	1.0	23.9	1.0	21.8	1.0	278.0
France	all maize	-	-	-	-	-	-	-	-	-
	MON 810	-	-	-	-	-	-	-	-	-
Portugal	all maize	78.4	9.0	78.4	9.0	78.4	9.0	96.7	10.0	300.0
	MON 810	53.9	1.5	53.9	1.5	53.9	1.5	61.5	1.5	240.0
Czech Republic	all maize	355.7	2.2	355.7	2.2	355.7	2.2	492.2	8.4	2,000.0
	MON 810	112.7	2.0	112.7	2.0	112.7	2.0	108.6	6.6	230.0
Slovakia	all maize	594.9	150.0	594.9	150.0	594.9	150.0	862.9	862.9	862.9
	MON 810	184.2	60.0	184.2	60.0	184.2	60.0	169.0	169.0	169.0
Germany	all maize	-	-	-	-	-	-	-	-	-
	MON 810	-	-	-	-	-	-	-	-	-
Romania	all maize	196.9	20.0	196.9	20.0	196.9	20.0	124.0	20.0	500.0
	MON 810	32.9	0.1	32.9	0.1	32.9	0.1	21.6	0.0	59.3
Poland	all maize	61.1	19.0	61.1	19.0	61.1	19.0	-	-	-
	MON 810	23.8	1.5	23.8	1.5	23.8	1.5	-	-	-

Table 11: Maize area (ha) per surveyed farmer in 2013, 2014 and 2015

Country	Total Area (ha)	2013 Mean	2013 Min	2013 Max	2014 Mean	2014 Min	2014 Max	2015 Mean	2015 Min	2015 Max
Spain	all maize	41.6	1.5	1,000.0	53.0	2.0	1,950.0	40.7	1.0	579
	MON 810	27.7	1.0	700.0	34.0	1.0	1,445.0	25.8	0.9	400
France	all maize	-	-	-	-	-	-	-	-	-
	MON 810	-	-	-	-	-	-	-	-	-
Portugal	all maize	103.7	10.0	537.0	111.7	10.0	800.0	109.6	10.0	728
	MON 810	58.4	1.0	240.0	64.3	1.0	640.0	66.3	1.0	582
Czech Republic	all maize	454.0	9.3	1,300.0	-	-	-	-	-	-
	MON 810	95.8	7.3	250.0	-	-	-	-	-	-
Slovakia	all maize	-	-	-	-	-	-	-	-	-
	MON 810	-	-	-	-	-	-	-	-	-
Germany	all maize	-	-	-	-	-	-	-	-	-
	MON 810	-	-	-	-	-	-	-	-	-
Romania	all maize	749.0	548.0	950.0	-	-	-	-	-	-
	MON 810	227.8	55.6	400.0	-	-	-	-	-	-
Poland	all maize	-	-	-	-	-	-	-	-	-
	MON 810	-	-	-	-	-	-	-	-	-

Figure 9 shows the mean percentage of MON 810 cultivation area within total maize area per farmer from 2006 to 2015.

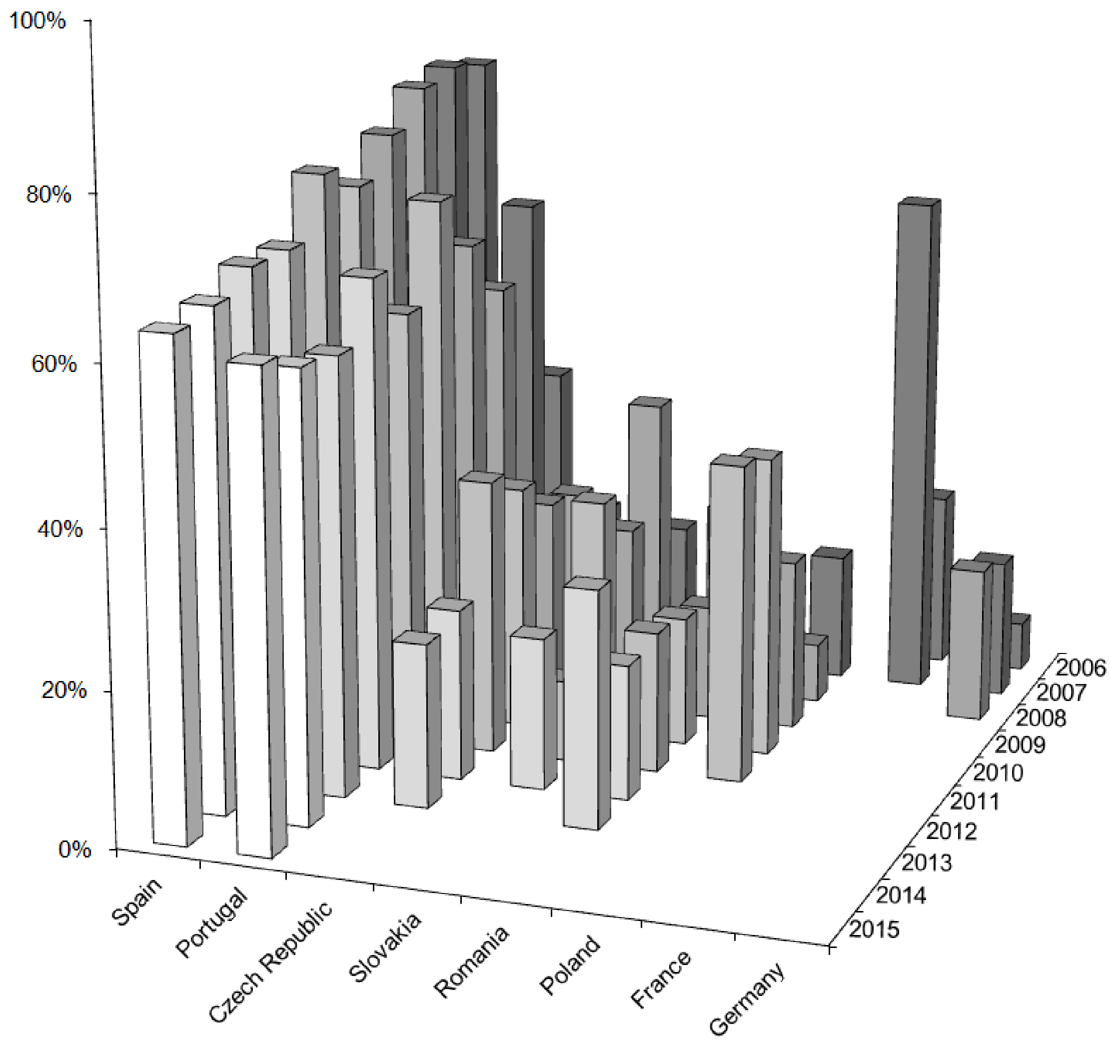

Figure 9: Mean percentage of MON 810 cultivation area of total maize area per farmer in 2006 - 2015 (surveyed countries only)

In 2015, MON 810 was cultivated on 1 - 40 fields per farm. On average every farmer cultivated MON 810 on 4-5 fields (Table 12).

Table 12: Number of fields with MON 810 in 2015

Valid N	Mean	Minimum	Maximum	Sum
261	4.61	1	40	1 203

3.2.4 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 on their farm in 2015. 47 different MON 810 varieties and 68 different conventional maize varieties were listed. The most frequently listed varieties (at least 6 times) together with their respective frequencies are listed in Table 13.

Table 13: Names of most cultivated MON 810 and conventional maize varieties in 2015

MON 810 maize		Conventional maize	
Variety	Frequency	Variety	Frequency
P 1758 Y	87	DKC 6728	51
PR 33 Y 72	59	P 1921	42
P 1574 Y	51	P 1758	36
P 1921 Y	36	P 1574	34
P 0725 Y	28	P 0725	21
DKC 6667 YG	24	DKC 6717	12
DKC 5277 YG	24	P 1570	12
PR 34 A 27	20	P 1524	12
P 1570 Y	15	DKC 6666	11
P 0837 Y	11	PR 33 Y 74	10
Poboa YG	10	PR 31 D 58	10
DKC 6729 YG	9	Antiss	10
DKC 6451 YG	8	P 0933	7
Antiss YG	8	Lerma	6
LG 30712 YG	8	PR 36 V 74	6
P 0222 Y	8	P 1535	6
PR 33 W 86	7		
Carella YG	6		
PR 31 D 61	6		
Talca YG	6		
ES Zoom YG	6		

3.2.5 Soil characteristics of the maize grown area

To assess the possible influence of the soil on monitoring characters, data on soil characteristics, quality and humus content were surveyed. Table 14 summarizes the reported soil types of the maize grown area.

Table 14: Predominant soil type of maize grown area in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	very fine	3	1.1	1.1	1.1
	fine	67	25.7	25.7	26.8
	medium	131	50.2	50.2	77.0
	medium-fine	21	8.0	8.0	85.1
	coarse	24	9.2	9.2	94.3
	no predominant soil type	15	5.7	5.7	100.0
Total		261	261	100.0	

Farmers' responses regarding the soil quality of the maize-grown areas are given in Table 15 and Figure 10. 97.3 % (254/261) of the maize was grown on $normal$ or $good$ soil according to the response of the farmers.

Table 15: Soil quality of the maize grown area as assessed by the farmers in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	below average - poor	7	2.7	2.7	2.7
	average - normal	191	73.2	73.2	75.9
	above average - good	63	24.1	24.1	100.0
Total		261	261	100.0	

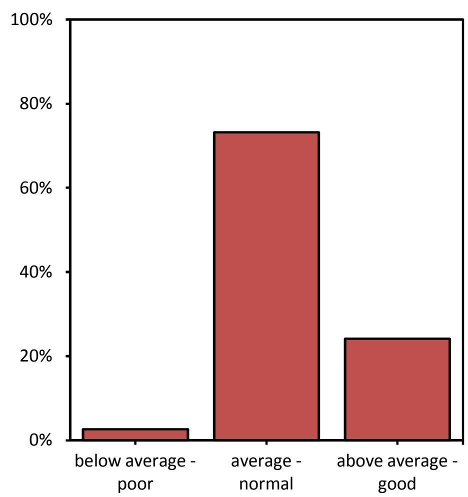

Figure 10: Soil quality of the maize grown area as assessed by the farmers in 2015

107 farmers were able to specify the humus content (not a commonly known measure all over Europe), which ranged from 0.55 % to 7.5 % with a mean of 2.0 % (Table 16). 154 farmers (all from Spain) did not specify the humus content.

Table 16: Humus content (%) in 2015

Valid N	Mean	Minimum	Maximum	Missing N

107	2.0	0.55	7.5	154

3.2.6 Local disease, pest and weed pressure in maize

Data of local disease, pest and weed pressures in maize were collected to find out if these environmental data had any influence on the values of the monitoring characters. These data differ from year to year, depending on the cultivation area and reflect the assessment of the farmer.

3.2.6.1 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 88.9 % (232/261) of the farmers (Table 17, Figure 11).

While in Spain only 10.4 % (22/212) found the local disease pressure to be low and 75.9 % (161/212) stated it to be $as\ usual$, farmers in Portugal seemed to evaluate it to be the other way around with 85.7 % (42/49) for low and 14.3 % (7/49) for $as\ usual$.

Table 17: Farmers assessment of the local disease pressure (fungal, viral) in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	low	64	24.5	24.5	24.5
	as usual	168	64.4	64.4	88.9
	high	29	11.1	11.1	100.0
Total		261	261	100.0	

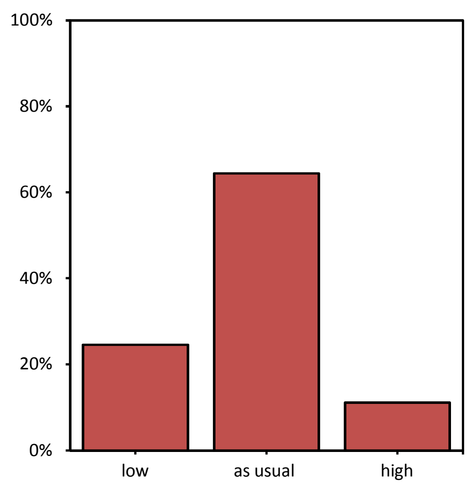

Figure 11: Farmers assessment of the local disease pressure (fungal, viral) in 2015

3.2.6.2 Local pest pressure as assessed by the farmers

Regarding the local pest pressure (insects, mites, nematodes), 80.1 % (209/261) of the farmers evaluated it to be low or $as\ usual$ and 19.9 % (52/261) evaluated it to be $high$ (Table 18, Figure 12). While in both countries two thirds of the farmers in Spain (135/212), but only one quarter of the farmers in Portugal (12/49) evaluated the local pest pressure to be $as\ usual$, all 52 farmers stating $high$ local pest pressure came from Spain.

Table 18: Farmers assessment of the local pest pressure (insects, mites, nematodes) in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	low	62	23.8	23.8	23.8
	as usual	147	56.3	56.3	80.1
	high	52	19.9	19.9	100.0
Total		261	261	100.0	

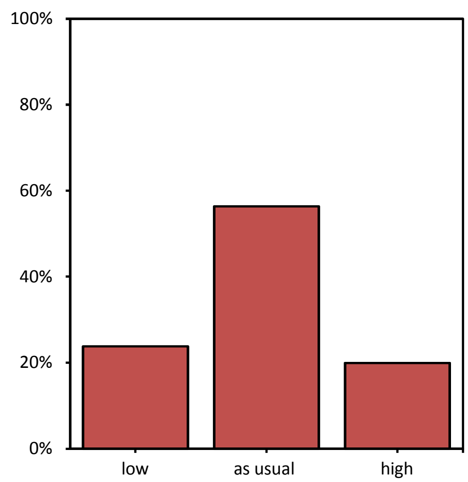

Figure 12: Farmers assessment of the local pest pressure (insects, mites, nematodes) in 2015

3.2.6.3 Local weed pressure as assessed by the farmers

94.6 % (247/261) assessed the local weed pressure to be low or $as\ usual$ and 5.4 % (14/261) evaluated it to be $high$ (Table 19, Figure 13).

Table 19: Farmers assessment of the local weed pressure in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	low	17	6.5	6.5	6.5
	as usual	230	88.1	88.1	94.6
	high	14	5.4	5.4	100.0
Total		261	261	100.0	

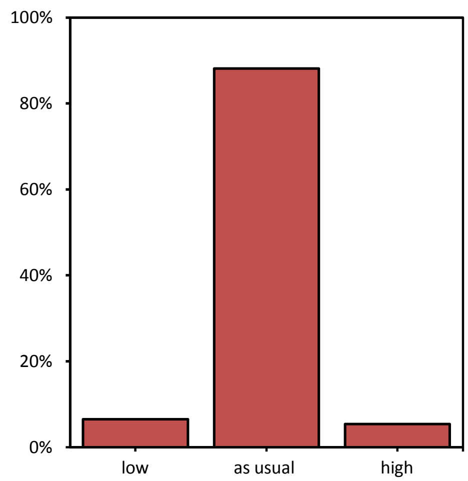

Figure 13: Farmers assessment of the local weed pressure in 2015

3.3 Part 2: Typical agronomic practices to grow maize

3.3.1 Irrigation of maize grown area

100 % (261/261) irrigated their fields (Table 20). The irrigation of the maize grown area is a productivity factor. These data reflect the general practices on the Iberian Peninsula. The irrigation depends on the weather conditions, even though it could be relevant for the analysis of GM maize specific effects.

Table 20: Irrigation of maize grown area in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	261	100.0	100.0	100.0
	no	0	0.0	0.0	100.0
Total		261	261	100.0	

Most of the irrigating farmers used Gravity (45.2 %) followed by Sprinkler (32.2 %) and Pivot (17.9 %). Some of them used more than one of the named or other types of irrigation (Table 21).

In Spain, Gravity (133/212) and Sprinkler (83/212) were the most common irrigation methods, while farmers in Portugal mostly used Pivot (33/49).

Table 21: Irrigation of maize grown area in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	Gravity	118	45.2	45.2	45.2
	Sprinkler	84	32.2	32.2	77.4
	Pivot	46	17.6	17.6	95.0
	other	5	1.9	1.9	96.9
	Gravity and other	3	1.1	1.1	98.1
	Sprinkler and Pivot	3	1.1	1.1	99.2
	Gravity and Pivot	1	0.4	0.4	99.6
	Pivot and other	1	0.4	0.4	100.0
Total		261	100.0	100.0	

3.3.2 Major rotation of maize grown area

The main crop rotation within three years is $maize - maize - maize$ followed by $maize - cereals - maize$, $multiple - multiple - maize$, $cereals - maize - maize$ and $cereals - cereals - maize$. Some other crop rotations were mentioned, but all with low occurrence (Table 22).

Table 22: Major rotation of maize grown area before 2015 planting season (two years ago and previous year) sorted by frequency

	two years ago	previous year	Frequency	Percentage	Valid percentage	Accumulated percentage
Valid	maize	maize	134	54.9	54.9	54.9
	maize	cereals	21	8.6	8.6	63.5
	cereals	maize	18	7.4	7.4	70.9
	cereals	cereals	15	6.1	6.1	77.0
	legumes	maize	11	4.5	4.5	81.6
	legumes	legumes	11	4.5	4.5	86.1
	maize	legumes	6	2.5	2.5	88.5
	cotton	potato	4	1.6	1.6	90.2
	maize	vegetables	3	1.2	1.2	91.4
	cereals	cotton	3	1.2	1.2	92.6
	vegetables	maize	2	0.8	0.8	93.4
	other oil plants	maize	1	0.4	0.4	93.9
	cotton	maize	1	0.4	0.4	94.3
	legumes	cereals	1	0.4	0.4	94.7
	other oil plants	cereals	1	0.4	0.4	95.1
	vegetables	cereals	1	0.4	0.4	95.5
	no cultivation	cereals	1	0.4	0.4	95.9
	cereals	legumes	1	0.4	0.4	96.3
	no cultivation	legumes	1	0.4	0.4	96.7
	cereals	vegetables	1	0.4	0.4	97.1
	legumes	vegetables	1	0.4	0.4	97.5
	maize	no cultivation	1	0.4	0.4	98.0
	maize	cotton	1	0.4	0.4	98.4
	cotton	cotton	1	0.4	0.4	98.8
	potato	cotton	1	0.4	0.4	99.2
	maize	potato	1	0.4	0.4	99.6
	cereals	other	1	0.4	0.4	100.0
Total			261	100.0	100.0	

3.3.3 Soil tillage practices

The farmers were asked to answer whether they performed soil tillage. 99.2 % (259/261) said yes (Table 23) while 0.8 % (2/261) answered no. The two farmers who answered no came from Spain.

Table 23: Soil tillage practices in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	259	99.2	99.2	99.2
	no	2	0.8	0.8	100.0
Total		261	261	100.0	

All farmers who said yes specified the time of tillage. 73.7 % (191/259) performed it in $winter$, 26.3 % (68/259) in $spring$ and no one in $winter\ and\ spring$ (Table 24, Figure 14). In Portugal, all 49 farmers stated that they performed soil tillage during $spring$.

Table 24: Time of tillage in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	winter	191	73.7	73.7	73.7
	spring	68	26.3	26.3	100.0
	winter & spring	0	0.0	0.0	100.0
Total		259	259	100.0	

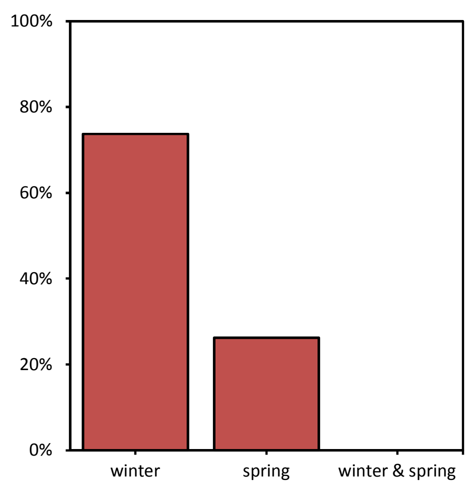

Figure 14: Time of tillage in 2015

3.3.4 Maize planting technique

91.2 % (238/261) of the farmers used *conventional* maize planting techniques, 7.7 % (20/261) *mulch* and 1.1 % (3/261) used *direct sowing* (Table 25, Figure 15).

Table 25: Maize planting technique in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	conventional planting	238	91.2	91.2	91.2
	mulch	20	7.7	7.7	98.9
	direct sowing	3	1.1	1.1	100.0
Total		261	100.0	100.0	

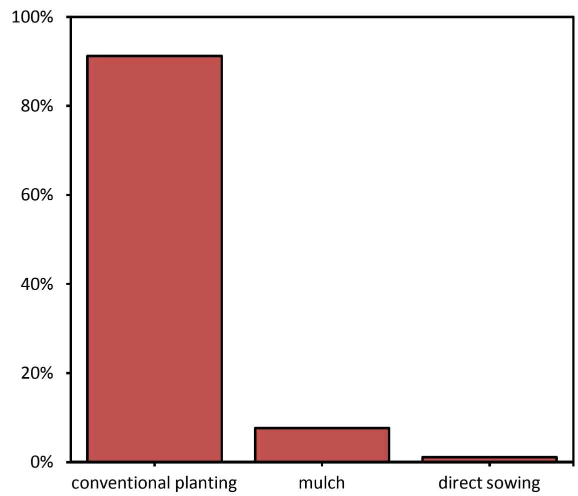

Figure 15: Maize planting technique in 2015

3.3.5 Typical weed and pest control practices in maize

Farmers were asked to specify the typical weed and pest control practices for maize at their farms. For conventional maize 98.9 % of all farmers (258/261) applied *insecticides* and 15.3 % (40/258) of them additionally applied *insecticides against corn borers*. All of the farmers (100.0 %, 261/261) used *herbicides*. None of the farmers used *biocontrol treatment*, *mechanical weed control* or *fungicides* (Table 26).

Table 26: Typical weed and pest control practices in maize in 2015

Insecticide(s)		Frequency	Percent
	yes	258	98.9
	no	3	1.1
Total		261	100.0
Insecticide(s) against Corn Borer		Frequency	Percent
	yes	40	15.3
	no	218	83.5
	Total	258	98.8
Missing	no statement	3	1.1
Total		261	100.0
Use of biocontrol treatments		Frequency	Percent
	yes	0	0.0
	no	261	100.0
Total		261	100.0
Herbicide(s)		Frequency	Percent
	yes	261	100.0
	no	0	0.0
Total		261	100.0
Mechanical weed control		Frequency	Percent
	yes	0	0.0
	no	261	100.0
Total		261	100.0
Fungicide(s)		Frequency	Percent
	yes	0	0.0
	no	261	100.0
Total		261	100.0
Other		Frequency	Percent
	yes	0	0.0
	no	261	100.0
Total		261	100.0

3.3.6 Application of fertilizer to maize grown area

All farmers (100 %, 261/261) applied fertilizer to the maize grown area (Table 27).

Table 27: Application of fertilizer to maize grown area in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	261	100.0	100.0	100.0
	no	0	0.0	0.0	100.0
Total		261	100.0	100.0	

3.3.7 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 25 February 2015 to 20 July 2015 (Table 28).

Table 28: Typical time of maize sowing in 2015

	Minimum	Maximum	Mean	Valid N
Sowing from	25.02.2015	01.07.2015	09.04.2015	261
Sowing till	05.03.2015	20.07.2015	05.05.2015	261

3.3.8 Typical time of maize harvest

In order to verify the plausibility of the data, farmers were also asked for their typical time of harvest. The time of harvest for maize grain ranged from 15 August 2015 to 31 December 2015 and for maize forage from 20 August 2015 to 20 December 2015 (Table 29).

Table 29: Typical time of maize harvest in 2015

	Minimum	Maximum	Mean	Valid N
Harvest grain maize from	15.08.2015	15.12.2015	11.10.2015	248
Harvest grain maize till	30.08.2015	31.12.2015	07.11.2015	248
Harvest forage maize from	20.08.2015	15.12.2015	05.10.2015	29
Harvest forage maize till	30.08.2015	20.12.2015	23.10.2015	29

3.4 Part 3: Observations of MON 810

3.4.1 Agricultural practice for MON 810 (compared to conventional maize)

3.4.1.1 Crop rotation

The crop rotation for MON 810 was specified to be $as\ usual$ in 93.5 % (244/261) of the cases (Appendix A Table A 1, Table 30, Figure 16). The individual specifications for $changed$ crop rotation before MON 810 are given in Appendix A, Table A 1.

Table 30: Crop rotation for MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	244	93.5	93.5	93.5
	changed	17	6.5	6.5	100.0
Total		261	261	100.0	

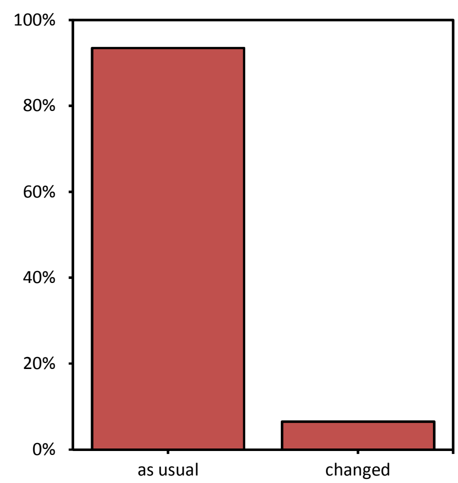

Figure 16: Crop rotation of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ crop rotation (93.5 %) is not significantly greater than 90 % at level of significance $\alpha = 0.01$ (Table 31) and therefore, the null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower 99 % confidence interval limit is 89.6 %, the upper limit is 97.4 %.

(2) The valid percentage of $changed$ crop rotation (6.5 %) is not significantly greater than 10 % at level of significance $\alpha = 0.01$ (Table 31) and therefore null hypothesis $p_{changed} \geq 0.1$ is not rejected.

An effect on crop rotation is indicated.

Table 31: Test results as well as 99% confidence intervals for $p_{As\,usual}$, p_{Minus} and p_{Plus} probabilities of crop rotation in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	244 (93.5%)	0.019			17 (6.5 %)	0.032

$p_{As\,usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
93.5%	89.6%	97.4%	-	-	-	6.5%	2.6%	10.4%

3.4.1.2 Time of planting

The time of planting of MON 810 was specified to be $as\ usual$ compared to conventional maize by 93.1 % (243/261) of the farmers (Table 32, Figure 17). The individual specifications for $later$ and $earlier$ planting of MON 810 are given in Appendix A, Table A 2.

Table 32: Time of planting for MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	earlier	1	0.4	0.4	0.4
	as usual	243	93.1	93.1	93.5
	later	17	6.5	6.5	100.0
Total		261	261	100.0	

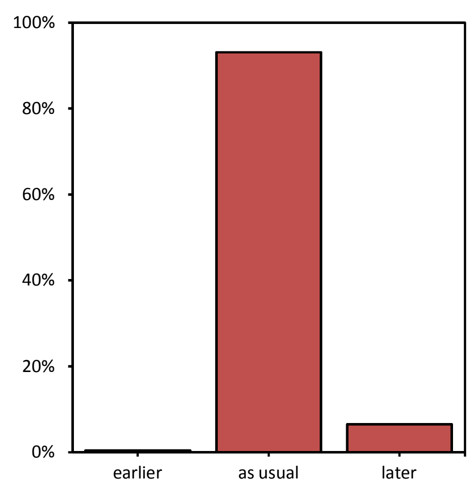

Figure 17: Time of planting of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ time of planting (93.1 %) is not significantly greater than 90 % at the level of significance $\alpha = 0.01$ (Table 33) and therefore, the null hypothesis $p_{as\,usual} \leq 0.9$ could not be rejected. The lower 99 % confidence interval limit is 89.1 %, the upper limit is 97.1 %.

(2) The valid percentage of $earlier$ time of planting (0,4 %) is significantly smaller than 10 %. The resulting P-value is less than the level of significance $\alpha = 0.01$ (Table 33), *i.e.* the null hypothesis for $p_{earlier\ planting} \geq 0.1$ could be rejected with a power of 100 %.

The valid percentage for $later$ time of planting (6.5 %) is not significantly smaller than the 10 % threshold at the level of significance $\alpha = 0.01$ (Table 33), *i.e.* the null hypothesis for $p_{later\ planting} \geq 0.1$ is not rejected. The lower 99 % confidence interval limit is 0.026, the upper limit is 0.104.

An effect on time of planting is indicated.

Table 33: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of time of planting in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	243 (93.1 %)	0.032	1 (0.4 %)	< 0.01	17 (6.5 %)	0.032

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
93.1%	89.1%	97.1%	0.4%	0.0%	1.4%	6.5%	2.6%	10.4%

3.4.1.3 Tillage and planting techniques

The majority of the farmers did not change the tillage and planting techniques of MON 810 compared to those used for conventional maize, as reflected in Table 34 and Figure 18. Only 9 farmers (3.4 %; all from Spain) indicated a change. The individual specifications for $changed$ tillage and planting techniques of MON 810 are given in Appendix A,Table A 3.

Table 34: Tillage and planting techniques for MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	251	96.2	96.5	96.5
	changed	9	3.4	3.5	100.0
	Total	260	99.6	100.0	
Missing	no statement	1	0.4		
Total		261	100.0		

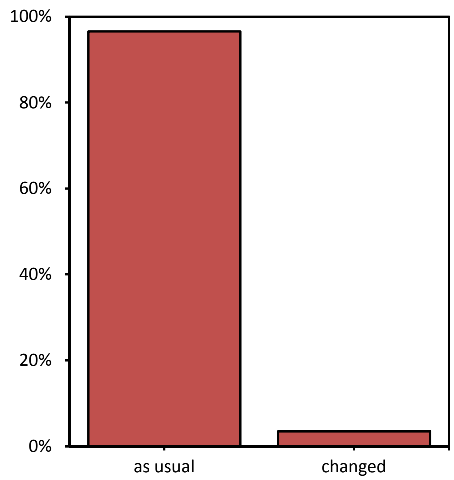

Figure 18: Tillage and planting techniques of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ tillage and planting techniques (96.5 %) is significantly greater than 90 %. The resulting P-value is less than the level of significance $\alpha = 0.01$ (Table 35) and therefore, the null hypothesis $p_{as\ usual} \leq 0.9$ is rejected with a power of 98.0 %.

No effect on tillage and planting techniques is indicated.

Table 35: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of tillage and planting techniques in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
260	251 (96.5 %)	< 0.01				

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
96.5%	93.6%	99.5%	-	-	-	3.5%	0.5%	6.4%

3.4.1.4 Insect and corn borer control practice

Insecticides applied in MON 810 fields sorted by their regulatory approval as seed treatment, spray application or microgranules are listed per country in Appendix A, Table A 4. MON 810 received insecticide treatments mainly through seed coatings, for which Thiacloprid was the major active ingredient in 2015. Abamectin and Chlorpyrifos were the most used active ingredients for spraying. Furthermore, Chlorpyrifos or Lambda-cyhalothrin wer the active ingredients of all named granulate insecticides.

All farmers were asked to describe their insect control practice in MON 810 compared to conventional maize in 2015. 85.4 % (223/261) specified no change in practice, while 14.6 % (38/261) used a $different$ program Table 36, Figure 19).

Table 36: Use of insect control in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	223	85.4	85.4	85.4
	changed	38	14.6	14.6	100.0
Total		261	261	100.0	

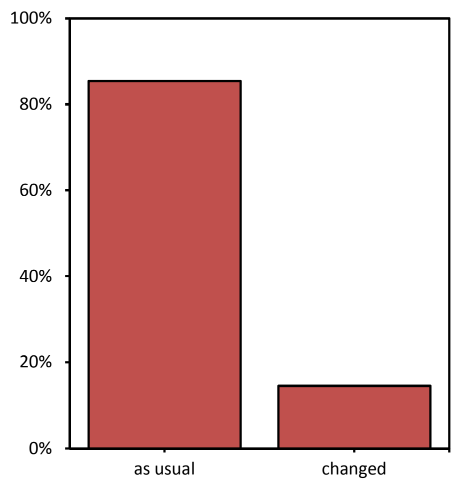

Figure 19: Insect control practice of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ insect control practice (85.4 %) is less than 90 %. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 37) and therefore, the null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower 99 %-confidence interval limit is 79.8 %, the upper limit is 81.1 %.

(2) The valid percentage of $changed$ insect control practice (14.6 %) is greater than 10 %. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 37) and therefore, the null hypothesis $p_{changed} \geq 0.1$ is not rejected.

An effect on insect control practice is indicated.

Table 37: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of insect control practice in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	223 (85.4 %)	0.988			38 (14.6 %)	1.0

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
85.4%	79.8%	91.1%	-	-	-	14.6%	8.9%	20.2%

All farmers that stated a difference in their insect control practices compared to conventional maize (Table 38) said that they specifically changed their corn borer control practice, as it is not necessary in MON 810 (Table 39, Figure 20). All individual explanations are given in Appendix A, Table A 5.

Table 38: Insect control practice compared to conventional maize in the context of the general use of insecticides in 2015

		Insect control practice in MON 810		
		as usual	changed	Total
Do you usually use insecticides? (section 3.3.5)	yes	220	38	258
	no	3	0	3
Total		223	38	261

Table 39: Corn Borer control practice compared to conventional maize in the context of the general use of insecticides against Corn Borer in 2015

		Corn borer control practice in MON 810		
		as usual	changed	Total
Do you usually use insecticides specifically against corn borer? (section 3.3.5)	yes	2	38	40
	no	218	0	218
	no statement	3	0	3
Total		203	38	261

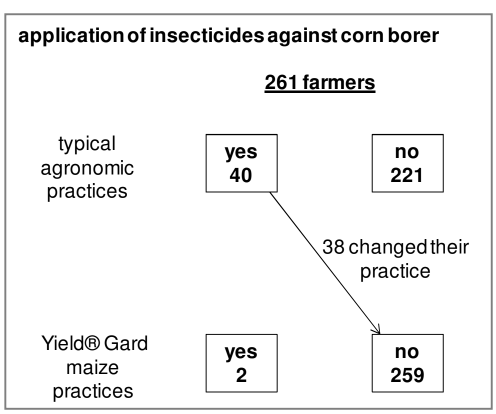

Figure 20: Change of insect control practice in MON 810 compared to conventional maize in 2015

The reduced use of conventional insecticides to control corn borers 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.

3.4.1.5 Weed control practice

The herbicides applied in MON 810 fields are listed in Appendix A, Table A 6. A wide number of herbicides and actives were used. The main actives of herbicides that were cited by the farmers are:

- Mesotrione
- (S)-Metolachlor
- Nicosulfuron
- Dicamba
- Terbuthylazine
- Bromoxynil
- Isoxaflutole
- Foramsulfuron
- Isoxadifen-ethyl
- Fluroxypyr

all of which are well-known products used for weed control in maize.

The farmers were asked to describe their weed control practice in MON 810 in 2015 compared to conventional maize. All farmers (100 %) used the same weed control in MON 810 compared to conventional maize (Table 40).

Table 40: Use of weed control in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	261	100.0	100.0	100.0
	changed	0	0.0	0.0	100.0
Total		261	261	100.0	

No effect on weed control practice is indicated.

3.4.1.6 Fungal control practice

Since in 2015 no farmer declared to use a fungicide, no statement about the most common active ingredient in fungicides can be made.

No farmer did change the fungicide program of MON 810 compared to that of conventional maize (Table 41).

No effect on fungal control practice is indicated.

Table 41: Use of fungicides on MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	261	100.0	100.0	100.0
	changed	0	0.0	0.0	100.0
Total		261	100.0	100.0	

3.4.1.7 Fertilizer application practice

All farmers answered the question regarding the fertilizer application in MON 810. No farmer used a *changed* program (Table 42).

Table 42: Use of fertilizer in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	261	100.0	100.0	100.0
	changed	0	0.0	0.0	100.0
Total		261	261	100.0	

No effect on fertilizer application practice is indicated.

3.4.1.8 Irrigation practice

All farmers answered the question regarding the irrigation practice in MON 810, no farmer *changed* the practice (Table 43).

Table 43: Irrigation practice in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	261	100.0	100.0	100.0
	changed	0	0.0	0.0	100.0
Total		261	100.0	100.0	

No effect on irrigation practice is indicated.

3.4.1.9 Harvest of MON 810

The farmers were asked whether they harvested MON 810 earlier or later than conventional maize or as usual. 249 of them (95.4 %) responded that no change in harvesting date was applied for MON 810. Only 4.2 % (11/261) stated that they harvested MON 810 *later* and no farmer (0.0 %) harvested *earlier* (Table 44, Figure 21). When asked for the reason for a *later* harvest of MON 810, one farmer said that it maturates later, while most farmers held the delayed sowing time responsible for it. The complete individual feedback of the farmers for a changed harvesting time is given in Appendix A, Table A 7.

Table 44: Harvest of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	earlier	0	0.0	0.0	0.0
	as usual	249	95.4	95.8	95.8
	later	11	4.2	4.2	100.0
	Total	260	99.6	100.0	
Missing	No statement	1	0.4		
Total		261	100.0		

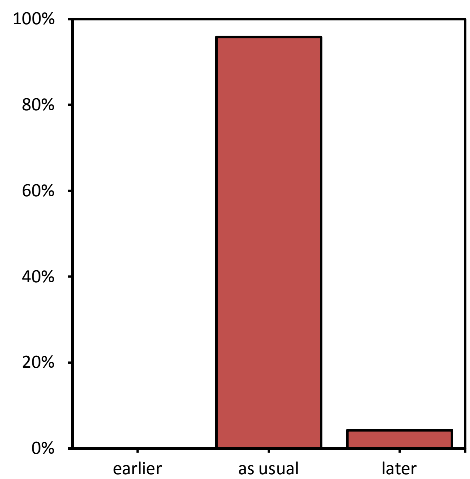

Figure 21: Harvest of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ harvest (95.8 %) is significantly greater than 90 %. The resulting P-value is less than the level of significance $\alpha = 0.01$ (Table 45) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could be rejected with a power of 91.2 %.

No effect on the harvest time is indicated.

Table 45: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of harvesting time in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
260	249 (95.8 %)	< 0.01				

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
95.8%	92.6%	99.0%	0.0%	0.0%	0.0%	4.2%	1.0%	7.4%

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

Agricultural practices in MON 810 (compared to conventional maize) were not changed in terms of time of harvest, tillage and planting techniques, weed control practice, fungal control practice, fertilizer application practice and irrigation practice. The main differences found refer to the insect and corn borer control practice of MON 810. Changes were also found in crop rotation and time of planting.

This difference in insect and corn borer control practice arises from farmers not controlling corn borers with conventional insecticide applications, because MON 810 is specifically designed to control corn borers as *Ostrinia nubilalis* and *Sesamia* spp. Furthermore, fewer insecticides were used in general since MON 810 is also less susceptible to several Lepidopteran pests other than *Ostrinia nubilalis* and *Sesamia* spp.

Changed crop rotation is justified by different previous crops at different fields.

Later time of planting is justified by logistic reasons, more flexibility due to corn borer resistance and short-cycle.

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

3.4.2.1 Germination vigour

While 13.0 % (34/261) of all farmers assessed the germination of MON 810 to be $more\ vigorous$, the other 87.0 % (227/261) found it to be $as\ usual$ (Table 46, Figure 22). Out of the 34 farmers who claimed the germination to be $more\ vigorous$, 32 came from Portugal. Most of these farmers made high field sanitation of Yieldgard maize accountable for the increased vigour. Individual explanations for the observations of the farmers are given in Appendix A, Table A 8.

Table 46: Germination of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less vigorous	0	0.0	0.0	0.0
	as usual	227	87.0	87.0	87.0
	more vigorous	34	13.0	13.0	100.0
Total		261	2.1	100.0	

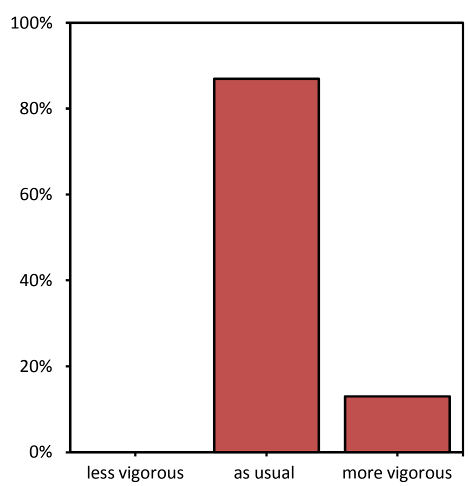

Figure 22: Harvest of MON 810 compared to conventional maize in 2015

(1) The valid percentage for $as\ usual$ germination (87.0 %) is smaller than 90 %. The resulting P-value exceeds the level of significance $\alpha = 0.01$ (Table 47), *i.e.* the null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower 99 % confidence interval limit is 81.6 %, the upper limit is 92.3 %.

(2) The valid percentage of $less\ vigorous$ germination (0 %) does not exceed the 10 % threshold. The P-value does not exceed the level of significance $\alpha = 0.01$ (Table 47), *i.e.* the null hypothesis for $p_{less\ vigorous} \geq 0.1$ could be rejected with a power of 100 %.

The valid percentage for $more\ vigorous$ germination (13.0 %) exceeds the 10 % threshold. The P-value exceeds the level of significance $\alpha = 0.01$ (Table 47), *i.e.* the null hypothesis for $p_{more\ vigorous} \geq 0.1$ is not rejected. The lower 99 % confidence interval limit is 7.7 %, the upper limit is 18.4 %.

An effect on the germination vigor is indicated.

Table 47: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of germination vigour in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for p_0 = 0.9	*Minus*	*P* for p_0 = 0.1	*Plus*	*P* for p_0 = 0.1
261	227 (87.0 %)	0.933	0 (0.0 %)	< 0.01	34 (13.0 %)	0.954

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
87.0%	81.6%	92.3%	0.0%	0.0%	0.0%	13.0%	7.7%	18.4%

3.4.2.2 Time to emergence

All except one farmer found the time to emergence to be $as\ usual$ (Table 48, Figure 23). The individual explanation for this observation is given in Appendix A, Table A 8.

Table 48: Time to emergence of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	1	0.4	0.4	0.4
	as usual	260	99.6	99.6	100.0
	delayed	0	0.0	0.0	100.0
Total		261	2.1	100.0	

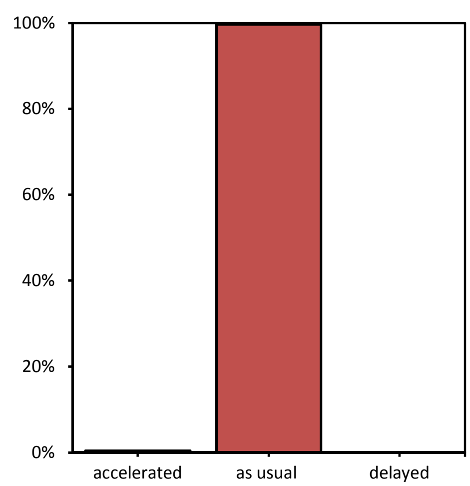

Figure 23: Time to emergence of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ time to emergence (99.6 %) is significantly greater than 90 %. The resulting P-value is less than the level of significance $\alpha = 0.01$ (Table 49) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could be rejected with a power of 100 %.

No effect on the time to emergence is indicated.

Table 49: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of time to emergence in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	260 (99.6 %)	< 0.01				

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
99.6%	98.6%	100.6%	0.4%	0.0%	1.4%	0.0%	0.0%	0.0%

3.4.2.3 Time to male flowering

All farmers assessed the time to male flowering to be $as\ usual$ (100.0 %,Table 50). Individual explanations for these observations are given in Appendix A, Table A 8.

Table 50: Time to male flowering of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	0	0.0	0.0	0.0
	as usual	261	100.0	100.0	100.0
	delayed	0	0.0	0.0	100.0
Total		261	100.0	100.0	

No effect on time to male flowering is indicated.

3.4.2.4 Plant growth and development

Plant growth and development was assessed to be $delayed$ in 0.4 % (1/261), $accelerated$ in 1.1 % (3/261), and to be $as\ usual$ in 98.5 % (257/261) of all cases (Table 51, Figure 24). Individual explanations for these observations are given in Appendix A, Table A 8.

Table 51: Plant growth and development of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	3	1.1	1.1	1.1
	as usual	257	98.5	98.5	99.6
	delayed	1	0.4	0.4	100.0
Total		261	261	100.0	

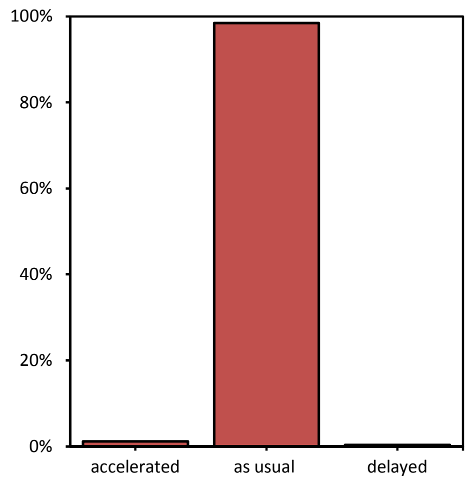

Figure 24: Plant growth and development of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ plant growth and development (98.5 %) is significantly greater than 90 %. The resulting P-value is less than the level of significance $\alpha = 0.01$ (Table 52) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could be rejected with a power of 100 %.

No effect on plant growth and development is indicated.

Table 52: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of plant growth and development in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	257 (98.5 %)	< 0.01				

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
98.5%	96.5%	100.4%	1.1%	0.0%	2.8%	0.4%	0.0%	1.4%

3.4.2.5 Incidence of stalk/root lodging

Incidence of stalk/root lodging was assessed to be $less$ in MON 810 compared to conventional maize in 27.2 % (71/261) of all cases (Table 53, Figure 25). All 71 farmers who claimed the incidence of stalk/root lodging to be $less$ came from Spain. Individual explanations for these observations are given in Appendix A, Table A 8.

Table 53: Incidence of stalk/root lodging of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less often	71	27.2	27.2	27.2
	as usual	190	72.8	72.8	100.0
	more often	0	0.0	0.0	100.0

Total	261	2.1	100.0

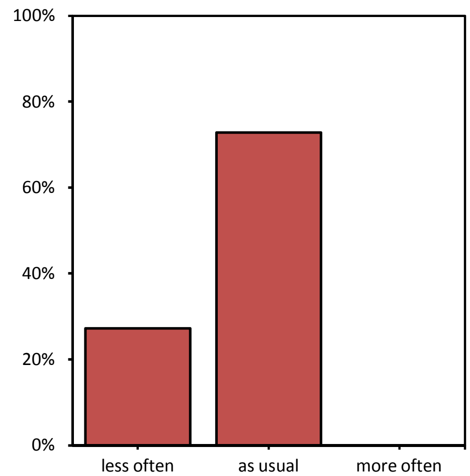

Figure 25: Incidence of stalk/root lodging of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ incidence of stalk/root lodging (72.8 %) is less than 90 %. The resulting P-value is larger than the level of significance $\alpha = 0.01$ (Table 54) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower 99 % confidence interval limit is 65.7 %, the upper limit is 79.9 %.

(2) The valid percentage of $less$ incidence of stalk/root lodging (27.2 %) does exceed the 10 % threshold. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 54) and therefore, the corresponding null hypothesis $p_{less\ often} \geq 0.1$ could not be rejected. The lower 99 % confidence interval limit is 20.1 %, the upper limit is 34.3 %.

The valid percentage of $more$ incidence of stalk/ root lodging (0.0 %) is significantly smaller than 10 % (Table 54) *i.e.* the null hypothesis for $p_{more\ often} \geq 0.1$ could be rejected with a power of 100 %.
An effect on the incidence of stalk/root lodging of MON 810 is indicated.

Table 54: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of incidence of stalk/root lodging in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	190 (72.8 %)	1.0	71 (27.2 %)	1.0	0 (0.0 %)	< 0.01

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
72.8%	65.7%	79.9%	27.2%	20.1%	34.3%	0.0%	0.0%	0.0%

3.4.2.6 Time to maturity

6.1 % (16/261; all 16 from Spain) of the farmers assessed the time to maturity to be $delayed$ for MON 810 (Table 55, Figure 26). Individual explanations for these observations are given in Appendix A, Table A 8.

Table 55: Time to maturity of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	accelerated	0	0.0	0.0	0.0
	as usual	245	93.9	93.9	93.9
	delayed	16	6.1	6.1	100.0
Total		261	261	100.0	

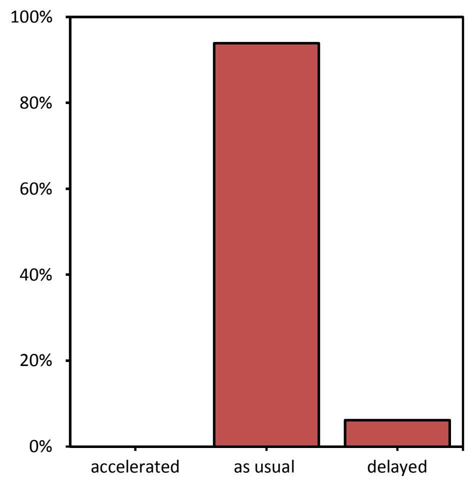

Figure 26: Time to maturity of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ time to maturity (93.9 %) is not significantly greater than 90 % at the level of significance $\alpha = 0.01$ (Table 56) and the null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower 99 % confidence interval limit is 90.0 %, the upper limit is 97.7 %.

(2) The valid percentage of $accelerated$ time to maturity (0.0 %) is significantly smaller than 10 % (Table 56) *i.e.* the null hypothesis for $p_{accelerated} \geq 0.1$ could be rejected with a power of 100 %.

The valid percentage of $delayed$ time to maturity (6.1 %) is not significantly smaller than the 10 % threshold. The resulting P-value is greater than level of significance $\alpha = 0.01$ (Table 56) and therefore, the corresponding null hypothesis $p_{delayed} \geq 0.1$ could not be rejected. The lower 99 % confidence interval limit is 2.3 %, the upper limit is 10.0 %.

An effect on the time to maturity of MON 810 is indicated.

Table 56: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of time to maturity in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	245 (93.9 %)	0.010	0 (0.0 %)	< 0.01	16 (6.1 %)	0.019

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
93.9%	90.0%	97.7%	0.0%	0.0%	0.0%	6.1%	2.3%	10.0%

3.4.2.7 Yield

Yield was $higher$ in 50.6 % (132/261) of all cases (Table 57, Figure 27). Individual explanations for these observations are given in Appendix A, Table A 8.

Table 57: Yield of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	lower yield	0	0.0	0.0	0.0
	as usual	129	49.4	49.4	49.4
	higher yield	132	50.6	50.6	100.0
Total		261	261	100.0	

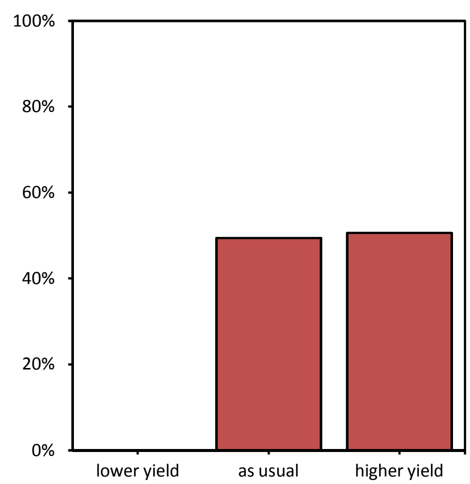

Figure 27: Yield of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ yield (49.4 %) is not greater than 90 %. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 58) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower confidence interval limit is 41.5 %, the upper limit is 57.4 %.

(2) The valid percentage of $lower$ yield (0.0 %) is significantly smaller than the 10 % threshold. The resulting P-value is smaller than the level of significance $\alpha = 0.01$ (Table 58) and therefore, the corresponding null hypothesis $p_{lower\ yield} \geq 0.1$ could be rejected with a power of 100 %.

The valid percentage of $higher$ yield (50.6 %) exceeds the 10 % threshold. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 58) and therefore, the corresponding null hypothesis $p_{higher\ yield} \geq 0.1$ could not be rejected. The lower confidence interval limit is 42.6 %, the upper limit is 58.5 %.

An effect on yield of MON 810 is indicated.

Table 58: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of yield in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	129 (49.4 %)	1.0	0 (0.0 %)	< 0.01	132 (50.6 %)	1.0

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
49.4%	41.5%	57.4%	0.0%	0.0%	0.0%	50.6%	42.6%	58.5%

3.4.2.8 Occurrence of volunteers

The occurrence of volunteers was assessed to be $less$ frequent for MON 810 than for conventional maize in 3.8 % (10/261) and $more$ frequent in 0.4 % (1/261) of all cases (Table 59, Figure 28). Individual explanations for these observations are given in Appendix A, Table A 8.

Table 59: Occurrence of MON 810 volunteers compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less often	10	3.8	3.8	3.8
	as usual	250	95.8	95.8	99.6
	more often	1	0.4	0.4	100.0
Total		261	261	100.0	

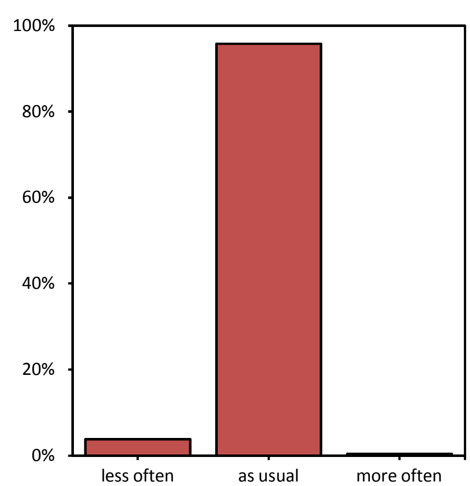

Figure 28: Occurrence of MON 810 volunteers compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ occurrence of volunteers (95.8 %) is significantly greater than 90 %. The resulting P-value is smaller than the level of significance $\alpha = 0.01$ (Table 60) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could be rejected with a power of 91.2 %.

No effect on occurrence of MON 810 volunteers is indicated.

Table 60: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of occurrence of volunteers in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	250 (95.8 %)	< 0.01				

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
95.8%	92.6%	99.0%	3.8%	0.8%	6.9%	0.4%	0.0%	1.4%

<u>Assessment of differences in the characteristics of MON 810 in the field (compared to conventional maize)</u>

The results for the characteristics of MON 810 in the field compared to conventional maize can be summarized as follows

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

These results underline the substantial equivalence of MON 810 to comparable conventional lines, as evidenced by recent genomic and proteomic analyses [Coll, 2008]; [Coll, 2009]; [Coll, 2010]; [Coll, 2011].

The more vigourous germination is likely associated with the quality of the germplasm.

Corn borer damage affects maturation and especially yield negatively, therefore the differences in these monitoring characters can be explained by the absence of corn borer damage. The difference in the incidence of stalk/root lodging can be explained similarly. Therefore, differences in these parameters are anticipated and only underline the effectiveness of corn borer control.

The longer time to maturity can also be assigned as 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 6.1 % of farmers. The low percentage indicates that this phenomenon is restricted to areas of pest pressure.

All additional observations during plant growth are listed in Appendix A, Table A 9.

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

Farmers assessed MON 810 to be $less\ susceptible$ to diseases in 4.2 % (11/261) of the time (

Table 61, Figure 29).

Table 61: Disease susceptibility in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less susceptible	11	4.2	4.2	4.2
	as usual	250	95.8	95.8	100.0
	more susceptible	0	0.0	0.0	100.0
Total		261	261	100.0	

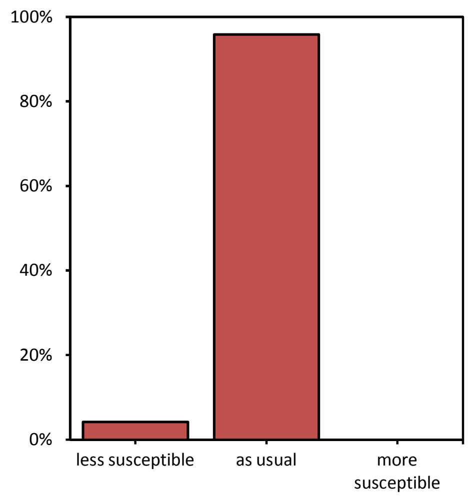

Figure 29: Disease susceptibility of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ disease susceptibility (95.8 %) is greater than 90 %. The resulting P-value is smaller than the level of significance $\alpha = 0.01$ (Table 62) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could be rejected with a power of 91.2 %.

No effect on disease susceptibility is indicated.

Table 62: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of disease susceptibility in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	250 (95.8 %)	< 0.01				

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
95.8%	92.6%	99.0%	4.2%	1.0%	7.4%	0.0%	0.0%	0.0%

The 11 farmers that answered different from $as\ usual$ were asked to specify the difference in disease susceptibility by listing the diseases with an explanation. Table 63 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 attributed to a lower susceptibility to *Ustilago maydis* (1.9 %, 5/261), *Helminthosporium* spp. (1.9 %, 5/261), *Fusariosis* (1.1 %, 3/261), *Cephalosporium spp.* (1.1 %, 3/261) and *Erwinia* (2.7 %, 7/261).

Table 63: Specification of differences in disease susceptibility in MON 810 compared to conventional maize in 2015

Group	Species	More	Less
Fungus	*Ustilago maydis*	0	5
	Helmithosporium spp.	0	5
	Fusariosis	0	3
	Cephalosporium spp.	0	3
Bacteria	*Erwinia*	0	7

Additional comments on disease susceptibility are given in (Appendix A, Table A 10).

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

The observed differences in disease susceptibility were not significant. The farmers that did find differences to some fungal species, specified as *Ustilago maydis, Helminthosporium* spp., *Fusarium* spp., and *Cephalosporium spp.,* as well as the bacterium *Erwinia*.

The finding of supposedly less disease susceptible MON 810 varieties is not surprising, as it has been well established that feeding holes and tunnels of the corn borer serve as entry points for secondary fungal infections, especially for *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 can be explained by corn borer control and confirm previous observations of lower fungal infections in MON 810 reported in the scientific literature [Munkvold, 1999]; [Dowd, 2000]; [Bakan, 2002]; [Hammond, 2003]; [Wu, 2006]. The farmers' testimonies (Appendix A, Table A 10) corroborate the findings from above.

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

The insect pest control of *O. nubilalis* (European corn borer) was assessed to be $very\ good$ or $good$ in 100.0 % (261/261) of the cases (Table 64, Figure 30).

Table 64: Insect pest control of *O. nubilalis* in MON 810 in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	weak	0	0.0	0.0	0.0
	good	11	4.2	4.2	4.2
	very good	250	95.8	95.8	100.0
Total		261	261	100.0	

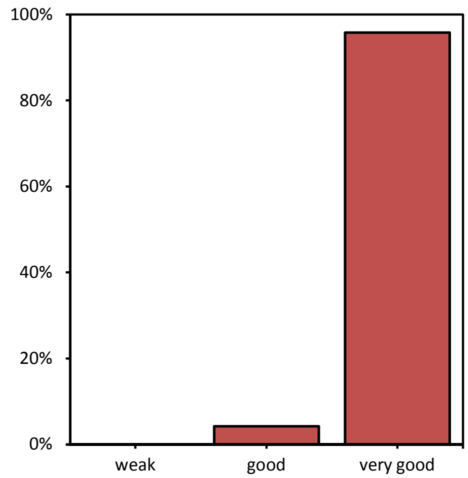

Figure 30: Insect pest control of *Ostrinia nubilalis* in MON 810 in 2015

100.0 % (250/250) of the farmers who gave a valid answer attested a $good$ or $very\ good$ control of *Sesamia* spp. (Pink Borer) (Table 65, Figure 31).

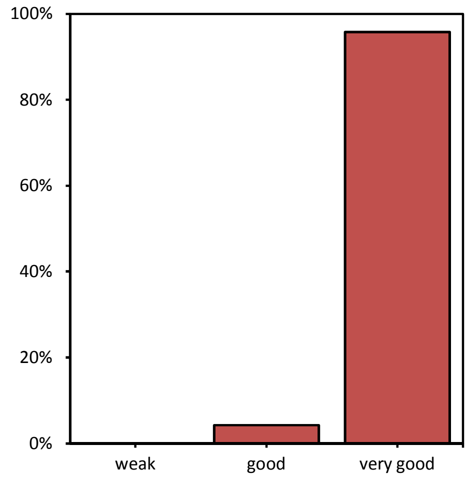

Figure 31: Insect pest control of *Sesamia* spp. in MON 810 in 2015

Table 65: Insect pest control of *Sesamia* spp. in MON 810 in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	weak	0	0.0	0.0	0.0
	good	11	4.2	4.2	4.2
	very good	250	95.8	95.8	100.0
Total		261	261	100.0	

Additional comments on insect pest control are listed in Appendix A,Table A 11.

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.

3.4.5 Other pests (other than *Ostrinia nubilalis* and *Sesamia* spp.) in MON 810 fields (compared to conventional maize)

Farmers assessed MON 810 to be *less susceptible* to pests in 21.8 % (57/261) of all cases (Table 66, Figure 32).

Table 66: Pest susceptibility of MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less susceptible	57	21.8	21.8	21.8
	as usual	204	78.2	78.2	100.0
	more susceptible	0	0.0	0.0	100.0

Total	261	261	100.0	

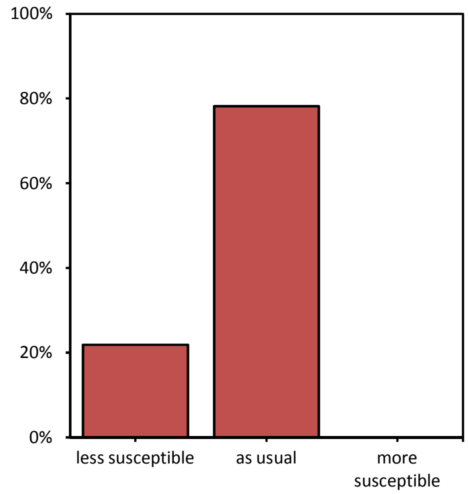

Figure 32: Pest susceptibility of MON 810 compared to conventional maize in 2015

(1) The valid percentage of $as\ usual$ pest susceptibility (78.3 %) is less than 90 %. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 67) and therefore, the corresponding null hypothesis $p_{as\ usual} \leq 0.9$ could not be rejected. The lower 99 % confidence interval limit is 71.6 %, the upper limit is 84.7 %.

(2) The valid percentage of lower pest susceptibility (21.8 %) exceeds the 10 % threshold. The resulting P-value is greater than the level of significance $\alpha = 0.01$ (Table 67) and therefore, the corresponding null hypothesis $p_{less\ susceptible} \geq 0.1$ could not be rejected.

The valid percentage of higher pest susceptibility (0.0 %) does not exceed the 10 % threshold and the resulting P-value is smaller than the level of significance $\alpha = 0.01$ (Table 67), *i.e.* the null hypothesis $p_{more\ susceptible} \geq 0.1$ could be rejected with a power of 100 %.

An effect on pest susceptibility is indicated.

Table 67: Test results as well as 99% confidence intervals for $p_{As\ usual}$, p_{Minus} and p_{Plus} probabilities of pest susceptibility in MON 810 compared to conventional maize in 2015

N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
261	204 (78.2 %)	1.0	57 (21.8 %)	1.0	0 (0.0 %)	< 0.01

$p_{As\ usual}$	lower 99 % confidence limit	upper 99 % confidence limit	p_{Minus}	lower 99 % confidence limit	upper 99 % confidence limit	p_{Plus}	lower 99 % confidence limit	upper 99 % confidence limit
78.2%	71.6%	84.7%	21.8%	15.3%	28.4%	0.0%	0.0%	0.0%

The 57 farmers that answered different from $as\ usual$ were asked to specify the observed difference in pest susceptibility by listing respective pests with an explanation. Table 68 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.

Table 68: Specification of differences in pest susceptibility in MON 810 compared to conventional maize in 2015

Order	Name	N valid	*As usual*	*P* for $p_0 = 0.9$	*Minus*	*P* for $p_0 = 0.1$	*Plus*	*P* for $p_0 = 0.1$
Lepidoptera	*Agrotis ipsilon*	261	218 (83.5 %)	1.0	43 (16.5 %)	1.0	0 (0.0 %)	< 0.01
	Spodoptera frugiperda	261	236 (90.4 %)	0.380	25 (9.6 %)	0.462	0 (0.0 %)	< 0.01
	Mythimna spp. *(Mitima)*	261	255 (97.7 %)	< 0.01				
	Spodoptera exigua	261	257 (98.5 %)	< 0.01				
	Heliothis	261	258 (98.9 %)	< 0.01				
Arachnida	*Tetranychos* spp.	261	250 (95.8 %)	< 0.01				
	Red Spider	261	258 (98.9 %)	< 0.01				
Cleoptera	*Agriotes* spp.	261	259 (99.2 %)	< 0.01				
Thysanoptera	Thysanoptera	261	260 (99.6 %)	< 0.01				

For grey highlighted probability values the binomial test against the threshold of 90 % for $As\ usual$-answers or 10 % for $Minus$ - or $Plus$-answers, respectively, resulted in p-values greater than $\alpha = 0.01$, so the null hypotheses, that these values are greater smaller than 90 % for $As\ usual$-answers or than 10 % for $Minus$ - or $Plus$-answers, respectively, could not be rejected, *i.e.* an effect is indicated.

What becomes clear in Table 68 is that for all listed pests except *Agrotis ipsilon* and *Spodoptera frugiperda*

(1) the valid percentages of $as\ usual$ pest susceptibility in MON 810 compared to conventional maize in 2015 are greater than 90 % and the resulting P-value is smaller than the level of significance $\alpha = 0.01$.Therefore, the corresponding null hypotheses $p_{as\ usual} \leq 0.9$ could be rejected with a power of 100 %, 100 %, 100 %, 91 %, 100 %, 100 % and 100 % for *Mythimna* spp., *Spodoptera exigua*, *Heliothis, Tetranychus* spp., Red Spider, *Agriotes* spp. and Thysanoptera, respectively.

No effect of those pests is indicated.

However, a different results were found for *Agrotis ipsilon* and *Spodoptera frugiperda*.

(1) The valid percentages of $as\ usual$ pest susceptibilities in MON 810 compared to conventional maize in 2015 are not significantly greater than 90 % and the resulting P-values are bigger than the level of significance $\alpha = 0.01$ (Table 68). Thus, the corresponding null hypotheses $p_{as\ usual} \leq 0.9$ could not be rejected. The 99 % confidence interval limit are [77.6 %; 89.4 %] for *Agrotis ipsilon* and [85.7 %; 95.1 %] for *Spodoptera frugiperda*.

(2) The valid percentages of lower susceptibility (16.5 % / 9.6 %) are not significantly smaller that the 10 % threshold. The resulting P-values are greater than the level of significance $\alpha = 0.01$ (Table 68) and therefore, the corresponding null hypotheses $p_{less\ susceptible} \geq 0.1$ could not be rejected.

The valid percentages of higher susceptibility (0.0 %) do not exceed the 10 % threshold and the resulting P-values are smaller than the level of significance $\alpha = 0.01$ (Table 68), *i.e.* the null hypotheses $p_{more\ susceptible} \geq 0.1$ could be rejected with a power of 100 %.

An effect on the plants' susceptibility to *Agrotis ipsilon* and *Spodoptera frugiperda* is indicated.

Additional comments on other pest (other than *Ostrinia nubilalis* and *Sesamia* spp.) are given in Appendix A, Table A 12.

Assessment of 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 two belonging to the order of Lepidoptera, *i.e. Agriotes* spp. and *Spodoptera frugiperda.*

The reduced susceptibility of MON 810 to Lepidoptera is not surprising, given the numerous scientific studies of 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 it specifically has toxic properties [Marvier, 2007]; [Wolfenbarger, 2008]. The monitoring data thus corroborate the conclusions drawn during the environmental risk assessment and ongoing research.

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

All farmers (261/261) found the weed pressure to be *as usual* in MON 810 fields compared to conventional fields (Table 69).

Table 69: Weed pressure in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less weeds	0	0.0	0.0	0.0
	as usual	261	100.0	100.0	100.0
	more weeds	0	0.0	0.0	100.0
Total		261	100.0	100.0	

No effect on weed pressure is indicated.

The farmers were asked to name the three most abundant weeds in their MON 810 fields. Weeds that were listed more than 30 times are:

- *Sorghum halepense*
- *Abutilon theophrasti*
- *Chenopodium album*
- *Setaria spp.*
- *Amaranthus retroflexus*
- *Xanthium strumarium*
- *Cyperus spp.*
- *Portulaca oleracea*

All named weeds and the corresponding frequencies of nomination are listed in Appendix A,Table A 13.

<u>Assessment of differences in weed pressure in MON 810 fields (compared to conventional maize)</u>

It is not surprising that the weed pressure in MON 810 fields has been described as similar to that in conventional maize. In accordance with the observations described in Section 3.4.1, no changes in weed control practices were reported in MON 810 fields compared to conventional maize fields.

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

3.4.7.1 Occurrence of non target insects

Farmers assessed the occurrence of non target insects in MON 810 fields to be *as usual* in 100 % (261/261) of all cases (Table 70).

Table 70: Occurrence of non target insects in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less	0	0.0	0.0	0.0
	as usual	261	100.0	100.0	100.0
	more	0	0.0	0.4	100.0
Total		261	261	100.0	

3.4.7.2 Occurrence of birds

100 % of the Farmers (261/261) assessed the occurrence of birds in MON 810 fields to be *as usual* (Table 71).

Table 71: Occurrence of birds in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less	0	0,0	0.0	0.0
	as usual	261	100.0	100.0	100.0
	more	0	0.0	0.4	100.0
Total		261	261	100.0	

3.4.7.3 Occurrence of mammals

100 % of the farmers (261/261) assessed the occurrence of mammals in MON 810 fields to be *as usual* (Table 72).

Table 72: Occurrence of mammals in MON 810 compared to conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	less	0	0.0	0.0	0.0
	as usual	261	100.0	100.0	100.0
	more	0	0.0	0.4	100.0
Total		261	261	100.0	

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. No farmers stated that they found a changed number of wildlife animals.

These results again underline 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 fields is limited. Studies have shown that no impact on mammals caused by the consumption of MON 810 is to be expected [Shimada, 2003]; [Shimada, 2006a]; [Shimada, 2006b]; [Stumpff, 2007]; [Bondzio, 2008].

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

5.4 % (14/261) of the farmers used the harvest of MON 810 to feed their animals (Table 73). These data reflect only the range of feeding; it is assumed that only farmers that cultivate silage maize feed them to their livestock. That could explain why only 5.4 % of the surveyed farmers fed MON 810, however, there are no strong data supporting this assumption.

Table 73: Use of MON 810 harvest for animal feed in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	14	5.4	5.4	5.4
	no	247	94.6	94.6	100.0
Total		261	261	100.0	

Out of the 14 farmers who did feed the harvest of MON 810 to their animals, 100 % (14/14) found the performance of them to be *as usual* when compared to the animals fed with conventional maize (Table 74). Additional comments on the performance of the animals fed MON 810 are listed in Appendix A, Table A 14.

Table 74: Performance of the animals fed MON 810 compared to the animals fed conventional maize in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	as usual	14	100.0	100.0	100.0
	changed	0	0.0	0.0	100.0
Total		14	100.0	100.0	

No effect on the performance of animals fed with MON 810 is indicated.

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

No farmer found a difference in performance of animals fed with MON 810.

3.4.9 Any additional remarks or observations

In the 2015 season no farmer made a comment on additional remarks or observations, *i.e.* no unexpected (adverse) effects are reported.

3.5 Part 4: Implementation of *Bt* maize specific measures

3.5.1 Information on good agricultural practices on MON 810

100 % (261/261) of the farmers reported to have been informed about the good agricultural practices applicable to MON 810 (Table 75).

95.8 % (250/261) of the farmers considered the training sessions to be either *useful* or *very useful* (Table 76). This information indicates that the great majority of the farmers had been exposed to a valuable training concerning MON 810.

Table 75: Information on good agricultural practices in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	261	100.0	100.0	100.0
	no	0	0.0	0.0	100.0
Total		261	261	100.0	

Table 76: Evaluation of training sessions in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	very useful	107	41.0	41.0	41.0
	useful	143	54.8	54.8	95.8
	not useful	11	4.2	4.2	100.0
Total		261	100,0	100.0	

3.5.2 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 99.6 % (260/261) of the 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 (95.4 %) reported that they are following the label recommendations on the seed bags (Table 77). 12 farmers from Spain (4.6 %) admitted that they did not follow the label recommendations. All of these farmers explained that they did not plant a refugee. Deviations from the label recommendations are listed in Appendix A, Table A 15.

Table 77: Compliance with label recommendations in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	248	95.0	95.4	95.4
	no	12	4.6	4.6	100.0
	Total	260	99.6	100.0	
Missing	no statement	1	0.4		
Total		261	100.0		

3.5.3 Prevention of insect resistance

80.8 % ((207+4)/261) did plant a refuge within their farms or were part of “production areas” in Portugal and comply collectively with this requirement (Table 78, Table A 16). Additionally, 14.6 % (38/261) of the farmers did not plant a refuge because they had less than 5 ha of MON 810 maize planted on their farm (the Insect Resistance Management Plan states that no refuge is required if less than 5 hectares of *Bt* maize are planted). 4.6 % (12/261) of the farmers reported that they did not plant a refuge although having more than 5 ha of maize planted on their farm.

Therefore, 95.4 % (249/261) of the farmers followed the label recommendations.

Table 78: Plant refuge in 2015

		Frequency	Percent	Valid percentages	Accumulated percentages
Valid	yes	207	79.3	79.3	79.3
	no, because the surface of *Bt* maize is < 5 ha	38	14.6	14.6	93.9
	no	16	6.1	6.1	100.0
Total		261	261	100.0	

All cases of not planting a refuge because of a *Bt* maize planted area < 5 ha occurred in Spain (Table 79).

Table 79: Refuge implementation per country in 2015

		Refuge implementation			
	Country	Yes	No, because the area of *Bt* maize is < 5 ha	No	Total
Valid	Spain	162	38	12	212
	Portugal	45	0	4	49
Total		207	38	16	261

As a result of the continuous and intensive training of farmers with regards to implementing a refuge, the overall compliance is again high this year. In Spain 6.8 % (12/174) of the farmers who were required to did not plant a refuge, for which two main reasons were given. The first reason was that the farmer had no or not enough information about the technical guidelines and feared the yield losses in conventional maize (8/12, 66.6 %), the second reason was that the sowing is complicated by planting a refuge (4/11, 33.3 %). All individual reasons for not planting a refuge are listed in Appendix A, Table A 16. Four farmers in Portugal reported they had not planted individual refuge because they were part of a “production area” and the group of farmers who are members of that production area had organized to ensure refuge compliance. These two cases were integrated in the compliant group because they comply collectively with the refuge requirements as indicated in the Portuguese regulation.

4 Conclusions

The analysis of 261 questionnaires from a survey of farmers cultivating MON 810 in 2015 in the two main MON 810 cultivating European countries did not reveal any unexpected adverse effects that could be associated with the genetic modification in MON 810. The sample size was proven to be large enough to significantly reject the hypotheses on adverse effects under the specific 2015 conditions.

The statistically significant effects reported in Part 3 were neither unexpected nor adverse. The corresponding observations 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 2014 growing seasons. Currently, the database contains data of 2 627 valid questionnaires. As shown in Table 80 and

Table 81, the frequency patterns of farmers' answers in 2015 are very similar to those of the previous years. In general the same effects have been observed.

After ten years of farmer questionnaires, no unexpected (adverse) effects have been indicated. Compared to the cultivation practices in conventional maize, farmers use nearly the same practices for cultivating MON 810. The abscence of damage caused by corn borers on the MON 810 plants renders the plants healthier and consequently provides more yield to the farmers.

In contrast to the data of the monitoring characters, the data of the influencing factors differ between the years.

Table 80: Overview on the frequency of $Minus^4$ answers of the monitoring characters in 2006 - 2015 in percent [%]. Grey-colored boxes mark cases where Hypothesis (2a) $H_0: p_{Minus} \geq 0.1$ could not be rejected.

Monitoring character[1]	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Time of planting	1.6	3.4	2.7	2.9	1.8	1.2	0.0	0.0	0.4	0.4
Time of harvest	2.4	3.8	3.4	2.1	2.2	0.4	0.0	0.0	0.4	0.0
Germination vigor	6.0	4.1	1.7	0.8	0.0	0.0	0.4	0.8	0.0	0.0
Time to emergence	6.9	3.1	6.4	5.4	4.1	0.8	0.8	0.0	0.0	0.4
Time to male flowering	0.4	1.7	4.7	2.1	3.7	0.0	0.8	0.8	0.0	0.0
Plant growth and development	6.5	6.9	9.8	5.9	7.0	0.8	1.6	1.2	0.0	1.1
Incidence of stalk / root lodging	58.9	36.2	38.6	31.9	35.1	24.5	28.1	17.2	26.8	27.2
Time to maturity	2.0	4.8	4.3	2.9	4.1	0.0	0.0	0.0	0.0	0.0
Yield	2.4	3.9	4.4	1.7	1.8	0.0	2.4	2.0	1.5	0.0
Occurrence of volunteers	33.9	8.4	11.1	10.8	8.2	6.9	4.2	4.0	1.1	3.8
Disease susceptibility	36.1	21.7	34.7	29.3	25.6	19.7	17.3	12.5	5.4	4.2
Pest susceptibility	11.1	5.9	18.5	17.2	18.6	17.7	21.3	18.0	16.1	21.8
Weed pressure	0.4	2.1	1.7	2.1	4.8	0.0	0.0	0.0	0.0	0.0
Occurrence of wildlife[3]	2.9	6.1	7.7	-	-	-	-	-	-	-
Occurrence of insects[2]	-	-	-	0.9	0.8	0.9	0.0	0.0	0.0	0.0
Occurrence of birds[2]	-	-	-	0.4	1.2	0.4	0.0	0.0	0.4	0.0
Occurrence of mammals[2]	-	-	-	0.9	1.1	0.4	0.4	0.4	0.4	0.0

Monitoring characters and their categories are defined in section 0.
[2] These characters are surveyed since the 2009 season.
[3] This character is surveyed since the 2008 season.
[4] The question on wildlife was asked until 2008. In 2009 it was split into three questions (non target insects, birds, mammals).

Table 81: Overview on the frequency of $Plus^5$ answers of the monitoring characters in 2006 - 2015 in percent [%].
Grey-colored boxes mark cases where Hypothesis (2b) $H_0: p_{Plus} \geq 0.1$ could not be rejected.

Monitoring Character[1]	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Crop rotation[2]	-	-	-	0.8	1.8	0.8	4.4	5.9	3.8	6.5
Time of planting	6.0	3.8	2.7	1.3	4.1	1.6	3.6	5.1	4.2	6.5
Tillage and planting technique	0.0	0.7	0.0	0.4	0.4	0.0	2.0	2.0	3.1	3.5
Insect control practices	48.0	11.9	22.2	18.3	16.2	24.9	17.3	16.4	16.5	14.6
Corn borer control practice[3]	-	-	9.8	22.9	15.5	22.9	18.1	16.0	16.1	14.2
Weed control practices	0.4	0.3	0.3	0.0	0.4	0.0	0.0	0.0	1.9	0.0
Fungal control practices	0.0	1.1	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Fertilizer Application	0.8	0.3	0.0	0.4	0.4	0.0	0.0	2.3	0.4	0.0
Irrigation Practices	1.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Time of harvest	24.1	18.6	13.8	7.9	6.6	4.4	4.0	5.1	4.6	4.2
Germination vigor	8.0	6.9	11.4	14.6	16.2	5.6	5.6	7.4	11.9	13.0
Time to emergence	5.6	3.8	2.0	0.8	0.4	0.0	0.4	0.4	0.0	0.0
Time to male flowering	1.6	7.7	3.7	1.7	2.6	2.0	1.2	0.4	0.4	0.0
Plant growth and development	1.6	4.8	2.7	2.1	3.7	0.8	2.0	0.8	0.0	0.4
Incidence of stalk / root lodging	1.6	0.3	0.3	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Time to maturity	30.9	25.9	24.0	14.6	16.2	12.9	16.1	12.5	11.5	6.1
Yield	68.7	44.8	52.7	56.9	49.8	43.4	43.0	34.8	36.0	50.6
Occurrence of volunteers	0.0	1.7	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.4
Disease susceptibility	2.0	1.0	0.7	0.4	0.4	0.0	0.0	0.0	0.0	0.0
Pest susceptibility	1.2	1.4	0.7	1.3	0.0	0.0	0.4	0.4	0.4	0.0
Weed pressure	0.0	0.3	0.3	0.0	0.4	0.0	0.0	0.4	0.0	0.0
Occurrence of wildlife[4]	2.1	2.9	2.4	-	-	-	-	-	-	-
Occurrence of insects[2]	-	-	-	0.9	0.4	0.4	0.0	0.0	0.0	0.0
Occurrence of birds[2]	-	-	-	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Occurrence of mammals[2]	-	-	-	1.3	1.1	0.4	0.0	0.0	0.0	0.0
Performance of animals	0.0	6.7	4.9	8.9	12.3	10.5	10.3	7.7	0.0	0.0

[6] Monitoring characters and their categories are defined in section 0.[2] These characters are surveyed since the 2009 season.

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[3] This character is surveyed since the 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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6 A Tables of free entries

Table A 1: Specifications for *changed* crop rotation before planting MON 810 (Section 3.4.1.1)

Country	Quest. Nr.	Crop rotation	Comments
Spain	4368	changed	I sow YieldGard after maize and Conventional maize after other crop (not maize) to avoid ECB.
Spain	4412		I sow YieldGard after pea and Conventional maize after maize.
Spain	4423		I sow YieldGard after wheat and Conventional maize after maize.
Spain	4425		I sow YieldGard after barley and Conventional maize after maize.
Spain	4451		I sow YieldGard after potato and Conventional maize after cotton.
Spain	4453		I sow YieldGard later after potato, and I sow Conventional maize sooner after maize.
Spain	4455		I sow YieldGard after potato and Conventional maize after maize.
Spain	4463		I sow YieldGard after beans or peas and Conventional maize after wheat.
Spain	4474		I sow YieldGard after cereals and Conventional maize after maize.
Spain	4494		I sow Conventional maize after maize and YieldGard after barley in the same year.
Spain	4501		I sow YieldGard after potato and Conventional maize after cotton.
Spain	4525		I sow YieldGard after maize and Conventional maize after cereals or tomato.
Spain	4533		I sow YieldGard after wheat and Conventional maize after cotton.
Spain	4535		I sow YieldGard after potato and Conventional maize after maize.
Spain	4536		I sow YieldGard after potato and Conventional maize after cotton.
Spain	4537		I sow YieldGard after wheat and Conventional maize after cotton.
Spain	4541		I sow YieldGard after pea and Conventional maize after maize.

Table A 2: Specifications for different time of planting of MON 810 (Section 3.4.1.2)

Country	Quest. Nr.	Time of planting	Comments aggregate	Comments
Spain	4436	earlier	logistic	I sow YieldGard for grain earlier than Conventional maize because it has more humidity.
Spain	4401	later	corn borer resistance	sow YieldGard after Conventional maize because ECB attacks more frequently in late sowings.
Spain	4467			I sow YieldGard shortly after Conventional maize. I sow Conventional sooner to avoid ECB attack.
Spain	4519			I sow Conventional maize sooner than YieldGard to avoid ECB attack.
Spain	4451		logistic	I sow YieldGard later, when I have harvested the previous potato.
Spain	4453			I sow YieldGard after harvesting the potatoes, I can sow the Conventional sooner, I do not have to wait.
Spain	4533			I sow YieldGard of shorter-cycle after harvesting wheat, I could sow Conventional sooner because it goes after cotton.
Spain	4535			I have to harvest the potato before and then sowing YieldGard.
Spain	4537			I wait until harvesting wheat and after that I sow YieldGard in the same year.
Spain	4412		YieldGard = short-cycle	YieldGard is of short-cycle and I can sow it later because it is resistant to ECB.
Spain	4423			YieldGard is of short-cycle and I can sow it later than the Conventional maize.
Spain	4425			I sow YieldGard later because it is of short-cycle, I sow Conventional maize earlier to avoid ECB.
Spain	4455			YieldGard is of short-cycle and I can sow it later after harvesting the potato.
Spain	4474			I sow YieldGard of short-cycle, it could be sowed later, in a period of a lot ECB´s attack.
Spain	4494			YieldGard is of short-cycle and I sow it after harvest the barley.
Spain	4501			YieldGard is of short-cycle and I sow it later after harvesting the potato.
Spain	4536			YieldGard is of short-cycle and I sow it later, after harvesting the potato.
Spain	4541			YieldGard is of short-cycle and I can sow it later than Conventional because it is resistant to ECB.

Table A 3: Specifications for *changed* tillage and planting technique of MON 810 (Section 3.4.1.3)

Country	Quest. Nr.	Tillage and planting technique	Comments aggregate	Comments
Spain	4425	changed	YieldGard - Direct Drilling, Conventional - Tillage. Due to less time with YieldGard	I do direct seeding in YieldGard because I have less time. In Conventional I do traditional tillage.
Spain	4451			I sow YieldGard with conservation tillage, with stubble on the surface.
Spain	4453			I sow YG with conservation tillage because I have less time, the Conv. with traditional tillage because I do have more time.
Spain	4455			I sow YG with conser.till. because I have less time as I sow it later. I sow Conv. with trad.till. because I do have more time.
Spain	4463			I sow YieldGard with conservation tillage and Conventional with traditional tillage.
Spain	4474			I do direct seeding in YieldGard to speed up, after harvesting barley, in Conventional I do traditional tillage.
Spain	4494			I do direct seeding in YieldGard because I do not have time, in Conventional I sow doing traditional tillage.
Spain	4501			YG is of short-cycle and I have to sow quickly with conser.till. In the Conventional I do trad.till. because I have enough time.
Spain	4535			I sow YieldGard with conservation tillage. I sow Conventional with traditional tillage because I do have more time.

Table A 4: Insecticides applied in MON 810 (Section 3.4.1.4) differentiated by their use

Active Ingredient	Insecticide as cited by the Farmer	Spain	Portugal	Total
Seed Treatment				
Thiacloprid	Sonido	172	49	221
	Total	172	49	**221**
Sprayed				
Abamectin	Apache	41	0	41
Alpha-Cypermethrin	Fastac SC Super Contact	0	1	1
Chlorpyrifos	Cloripirfos 48, Chas 48, AGRICLOR 5L	19	0	19
Deltametrin	Decis, Decis Protech	3	4	7
Indoxacarb	Steward EC	0	1	1
Lambda-cyhalothrin	Karate+, Judo, Karate Zeon	5	50	55
	Total	68	56	**124**
Granulated				
Chlorpyrifos	Cloripirifos 5 GR, Pison, Closar 5 GR, Piritec 5 GR, Rimi	35	0	35
Lambda-cyhalothrin	TRIKA Lambda 1	10	0	10
	Total	45	0	**45**
Total		**285**	**105**	**390**

Table A 5: Explanations for *changed* insect and corn borer control practice in MON 810 (Section 3.4.1.4)

Country	Quest. Nr.	Insecticides in conv. maize	Insect control practice in MON 810	Explanation of differences in insect control practice	Insecticides against corn borers in conv. maize	Corn borer control in MON 810	Explanation of differences in corn borer control practice
Spain	4374	yes	changed	I treat Conventional against ECB with Clorpirifos and I do not treat YieldGard.	yes	changed	It is not necessary to treat YieldGard against ECB, in Conventional I apply Clorpirifos to control ECB.
Spain	4408			I do not treat against ECB the YieldGard but I do it with Conventional.			I dont need YieldGard against ECB. I use Conventional and apply Clorpirifos 48 % added to the irrigation water by sprinkling.
Spain	4425			I treat against ECB in Conventional, in YieldGard it is not necessary.			I do not need to treat YieldGard against ECB but I need to do it in Conventional.
Spain	4434			I do not treat YieldGard against ECB, I do it with Conventional.			I treat for prevention against ECB the Conventional. In YieldGard it is not necessary because it is resistant.
Spain	4468			I do not treat YieldGard against ECB but I do with the Conventional.			I do not treat YieldGard against ECB. I treat Conventional with Clorpirifos to control ECB.
Spain	4494			I need to treat against ECB the Conventional but I do not need to treat in YieldGard.			I treated Conventional against ECB using Clorpirifos 48 %. I did not treat YieldGard because it is resistant.
Spain	4499			I treat Conventional against ECB and I do not in YieldGard.			In Conventional I applied one insecticide treatment against ECB, in YieldGard I did not because it is resistant.
Spain	4504			I do not have to treat against ECB the YieldGard, but I have to do it with Conventional.			I do not treat YieldGard against ECB because it is resistant but I do it in the Conventional.
Spain	4539			I do not treat YieldGard against ECB but I do it in the Conventional.			I do not need to treat against ECB in YieldGard. In Conventional I apply Clorpirifos 48 % to control ECB.
Spain	4551			I treat against ECB the Conventional, in YieldGard it is not necessary.			I do not need to treat YieldGard against ECB, I do it with Conventional.
Spain	4573			I did not treat YieldGard against ECB but I did it in Conventional.			YG is resistant to ECB and it is not necessary to treat it, in Conventional it is necessary to treat applying an insecticide.
Portugal	4579	yes	changed	The farmer made 1 less insecticide treatments in the Yieldgard maize fields.	yes	changed	The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4580			The farmer made 1 less insecticide treatments in the Yieldgard maize fields.			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.

Portugal	4581	yes	changed	The farmer used 1 less insecticide treatment in Yieldgard maize fields, because it was sufficient for Yieldgard fields	yes	changed	The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields because it wasn´t necessary.
Portugal	4583			The farmer made less 1 insecticide treatments in the Yieldgard maize fields.			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields because it wasn´t necessary.
Portugal	4584			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard fields.
Portugal	4585			Due to historcial and personal experience from several years, the farmer used 2 less insecticide treatments in Yieldgard maize			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4586			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard fields.
Portugal	4587			The farmer used 2 less insecticide treatment in Yieldgard maize fields, because it was sufficient for Yieldgard fields			No treatment for maize borer control was used by the farmer because it was unnecessary
Portugal	4588			Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			In contrast to conventional fields, the farmer did not control for maize borer in Yieldgard maize fields
Portugal	4589			The farmer made, in general, 2 less insecticide treatments in the Yieldgard maize fields.			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4590			Farmer used on average 2 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			The farmer did not control for maize borer in Yieldgard maize fields, which is a great advantage for Yieldgard maize
Portugal	4591			The farmer made, in general, 2 less insecticide treatments in the Yieldgard maize fields.			The farmer didn´t make any treatments for the control of maize borer.
Portugal	4593			Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4594			Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4595			Farmer used on average 2 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			The farmer did not make any kind of treatments for the control of maize borer in the Yieldgard fields.

Portugal	4596	yes	changed	Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields	yes	changed	Without any treatments for the control of maize borer in the Yieldgard maize fields, had no need to control the maize borer.
Portugal	4597			Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4598			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			No treatment for maize borer control was used by the farmer because it was unnecessary
Portugal	4599			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			Without any treatments for the control of maize borer in the Yieldgard maize fields, had no need to control the maize borer.
Portugal	4602			The farmer made an average of 2 less insecticide treatments in the Yieldgard maize fields.			The farmer didn´t make any kind of treatments for the control of maize borer in the Yieldgard maize fields.
Portugal	4608			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			No treatment for maize borer control was used by the farmer because it was unnecessary
Portugal	4609			Farmer used on average 2 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			The farmer did not make any kind of treatments for the control of maize borer in the Yieldgard fields.
Portugal	4610			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			No treatment for maize borer control was used by the farmer because it was unnecessary
Portugal	4623			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer.
Portugal	4625			Farmer used 1 less insecticide treatment in Yieldgard maize fields, but similar seed treatment for Yieldgard and conv. fields			The farmer didn´t make any treatments for the control of maize borer.
Portugal	4626			Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			No treatment for maize borer control was used by the farmer because it was unnecessary
Portugal	4627			Farmer used at least 1 less insecticide treatment in Yieldgard, but similar seed treatment for Yieldgard and conv. fields			No treatment for maize borer control was used by the farmer because it was unnecessary
Portugal	4579			The farmer made 1 less insecticide treatments in the Yieldgard maize fields.			The farmer didn´t make any treatments for the control of maize borer in the Yieldgard maize fields.

Table A 6: Herbicides applied in MON 810 (Section 3.4.1.5)

Active Ingredient	Herbicides as stated by the farmers	Spain	Portugal	Total
Mesotrione, (S)-Metolachlor	Camix	106	2	**108**
(S)-Metolachlor, Terbuthylazine	Primextra Líquido Gold	105	0	**105**
Nicosulfuron	Elite Plus 6 OD	63	6	**69**
Dicamba	Banvel D	52	0	**52**
Mesotrione, (S)-Metolachlor, Terbuthylazine	Lumax	0	44	**44**
Nicosulfuron	Elite M	29	0	**29**
Foramsulfuron, Isoxadifen-ethyl	Option	0	26	**26**
Isoxadifen-ethyl, Tembotrione	Laudis	10	15	**25**
Bromoxynil	Buctril	13	6	**19**
Nicosulfuron	Samson	0	17	**17**
Mesotrione	Callisto	10	5	**15**
Fluroxypyr	Starane 20	14	0	**14**
Pethoxamid	Successor 600	12	0	**12**
Isoxaflutole	Spade Flexx	9	0	**9**
Sulcotrione	Sudoku	0	9	**9**
Nicosulfuron, Terbuthylazine	Winner Top	0	9	**9**
Nicosulfuron	Sajon	8	0	**8**
Fluroxypyr	Tomahawk	8	0	**8**
Glyphosate	Glyphosate 36 %	7	0	**7**
Aclonifen, Isoxaflutole	Lagon	7	0	**7**
2,4-D, Florasulam	Mustang	7	0	**7**
Flufenacet, Terbuthylazine	Aspect	0	6	**6**
Isoxaflutole	Spade	6	0	**6**
Atrazine	Atrazina 500 SC	5	0	**5**
Nicosulfuron	PANTANI	4	0	**4**
Isoxaflutole	Adengo	0	3	**3**
(S)-Metolachlor, Terbuthylazine	Cuña Plus	3	0	**3**
Bromoxynil	HERMOXIN	3	0	**3**
Fluroxypyr	Hurler	3	0	**3**
Sulcotrione	Pentagon	3	0	**3**
MCPA	PROCER M 40	3	0	**3**
Pendimethalin, Dimethenamid-P	Wing P	3	0	**3**
Sulcotrione	Zeus	0	3	**3**
Nicosulfuron	Bandera 4 SC	2	0	**2**
Bentazon, Dicamba	Laddok Plus	0	2	**2**
Foramsulfuron, Thiencarbazone-methyl, Cyprosulfamide	MONSOON ACTIVE	2	0	**2**
Nicosulfuron	Nicosulfuron 4 %	2	0	**2**
Nicosulfuron, Terbuthylazine	Nicoter	0	2	**2**
(S)-Metolachlor, Terbuthylazine	Primextra Líquido Gold	0	2	**2**
Glyphosate	Roundup Plus	2	0	**2**

Nicosulfuron	Samson	2	0	**2**
Trifluralin	Bonanza	0	1	**1**
Bromoxynil	Bromotril 24 EC	1	0	**1**
Prosulfron, Dicamba	Casper 55 WG	1	0	**1**
Atrazine	CONTROLLER 500 SC	1	0	**1**
Foramsulfuron, Isoxadifen-ethyl	Cubix	1	0	**1**
Sulcotrione	Decano	1	0	**1**
Mesotrione, Nicosulfron	Elumis 105 OD	1	0	**1**
Bromoxynil	Emblem	1	0	**1**
Fluroxypyr	Fluroxypyr	1	0	**1**
MCPA	Herpan 40	1	0	**1**
Fluroxypyr	HUDSON 20 EC	1	0	**1**
Nicosulfuron	KELVIN OD	1	0	**1**
Pethoxamid	Koban 600	1	0	**1**
Linuron	LINURON FLOW	1	0	**1**
Clopyralid	LONTREL SUPER	1	0	**1**
Aclonifen, Isoxaflutole	Memphis	1	0	**1**
Nicosulfuron	Nico M	1	0	**1**
Nicosulfuron	Nico M	0	1	**1**
Nicosulfuron	Nicogan	1	0	**1**
Nicosulfuron	Nicozea	1	0	**1**
Nicosulfuron	NIC-SAR	1	0	**1**
Nicosulfuron	NISSHIN	1	0	**1**
Nicosulfuron	NYCOS	1	0	**1**
Rimsulfuron	Principal	1	0	**1**
Imazamox	PULSAR 40	1	0	**1**
Nicosulfuron	RETRIEVE	1	0	**1**
Dimethenamid-P	Spectrum	1	0	**1**
Pendimethalin	Stomp Aqua	1	0	**1**
Sulcotrione	Sulcotrina	1	0	**1**
(S)-Metolachlor, Terbuthylazine	Tyllanex Magnum	1	0	**1**
2,4-D	U 46 D complet	1	0	**1**
Total		**532**	**159**	**691**

Table A 7: Explanations for different harvest time of MON 810 (Section 3.4.1.9)

Country	Quest. Nr.	Harvest	Comments aggregate	Comments
Spain	4467	later	Conventional harvested earlier to avoid ECB damage	I harvest earlier the Conventional so it will not fall if it has ECB damages or if it rains.
Spain	4436		Grain production	I harvest YieldGard later because it is for grain, the Conventional is for forage and I harvest it earlier when is still green.
Spain	4425		Sown later, harvested later	I harvest YieldGard later because I sow it later than the Conventional.
Spain	4453			I harvest YieldGard later than Conventional because I also sow it later.
Spain	4455			I harvest YieldGard later because I sow it later.
Spain	4474			I sow YieldGard later than Conventional, and I also harvest it later.
Spain	4494			I harvest YieldGard later because I sow it later than the Conventional.
Spain	4501			YieldGard is harvested later because it is sowed later than Conventional.
Spain	4519			I sow YieldGard later than Conventional and I also harvest it later.
Spain	4536			YieldGard is harvested later because it is sowed later than Conventional.
Spain	4368		YieldGard maturates later	YieldGard healthier, matures later and I can harvest it later than the Conventional.

Table A 8: Explanations for characteristics of MON 810 different from *as usual* (Section 3.4.2)
Grey-colored fields mark answers that are not “as usual”.

Country	Quest. Nr.	Germi-nation	Emergence	Male flow-ering	Plant growth	Stalk/-root lodging	Maturity	Yield	Volun-teers	Comments
Spain	4367	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4368	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard healthier, greener, with no damages of ECB, it does not fall and produces more than Conventional.
Spain	4369	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard without damages of ECB, greener, healthier, it produces more than Conventional.
Spain	4370	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4371	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard produces more kilos than the Conventional because it is healthier with no damages of ECB.
Spain	4372	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4373	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard without damages of ECB, it is healthier, completes the whole cycle and produces more than the Conventional.
Spain	4374	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard without damages of ECB, it is healthier and it gives more production than Conventional.
Spain	4375	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard gives more production than the Conventional because it does not have attack of ECB.
Spain	4376	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4377	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than the Conventional, with no damages of ECB.
Spain	4378	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4379	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4380	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4381	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4382	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is resistant to ECB, it is healthier and provides higher production than the Conventional.
Spain	4383	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not have damages of ECB, it does not fall and the production is higher than the Conventional.
Spain	4384	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard healthier, without damages of ECB and produces more than Conventional one.
Spain	4385	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4386	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	YieldGard healthier because is resistant to ECB, it is greener and matures a bit later and produces more than Conventional.

Spain	4387	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard does not fall because it does not have ECB damages, delays the maturation a week and gives mores production than Conventional.
Spain	4388	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4389	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no ECB damages and produces more than Conventional.
Spain	4390	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4391	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard is resistant to ECB, it is healthier and greener, matures a few days later, it does not fall and gives more kilos than Conventional.
Spain	4392	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because it has no ECB damages, it is healthier and produces more than Conventional.
Spain	4393	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is more resistant to ECB, it is healthier, does not fall and gives more kilos than Conventional.
Spain	4394	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4395	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard healthier, without damages of ECB, does not fall and it is more productive than Conventional.
Spain	4396	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4397	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because it has no ECB damages and it is more productive than Conventional.
Spain	4398	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, does not fall because it is healthier, it is all harvested and produces more than Conventional.
Spain	4399	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is healthier, without ECD damages, the plants and ears do not fall and it gives more kilos than the Conventional.
Spain	4400	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4401	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	YieldGard is more resistant to ECB, it does not fall, there are less volunteers the next year, is healthier and produces more than Conventional.
Spain	4402	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4403	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4404	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages, the ears and plants do not fall and it gives more kilos than Conventional.
Spain	4405	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4406	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4407	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4408	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because is resistant to ECB and is healthier, it is all harvested and is more productive than Conventional.
Spain	4409	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard healthier, greener, matures a few days later, it has no ECB damages and the plants and ears do not fall and produces more than Conventional.
Spain	4410	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is more productive than Conventional because it does not fall as it has not ECB damages.
Spain	4411	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4412	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no harvest losses because it is resistant to ECB and produces more

										than Conventional.
Spain	4413	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4414	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4415	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages, it does not fall, it is healthier, is all harvested and it gives more kilos than Conventional.
Spain	4416	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is healthier, without ECB damages, the plants and ears do not fall, is all harvested and gives more kilos than Conventional.
Spain	4417	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4418	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no ECB damages and gives more kilos than Conventional.
Spain	4419	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard produces more than Conventional because is healthier, without ECB damages.
Spain	4420	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is healthier because is resistant to ECB and produces more kilos than Conventional.
Spain	4421	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4422	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages, does not fall and is more productive than Conventional.
Spain	4423	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, is healthier, the plants and ears do not fall and produces more than Conventional.
Spain	4424	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4425	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	YieldGard is resistant to ECB, does not fall and there are less volunteers, is all harvested and produces more than Conventional.
Spain	4426	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4427	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4428	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4429	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4430	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4431	as usual	as usual	as usual	as usual	less often	delayed	higher yield	less often	YieldGard without ECB damages, is greener and it delays a bit the maturation, it does not fall and the next year there are no volunteers, is all harvested and it gives more kilos than Conventional.
Spain	4432	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4433	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB and has no damages in the plants and ears, they do not fall and it produces more than Conventional.
Spain	4434	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4435	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4436	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4437	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard healthier, no ECB damages and produces more than Conventional.

Spain	4438	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	YieldGard is healthier because is resistant to ECB, the plants and ears do not fall, there are less volunteers the next year and produces more than Conventional.
Spain	4439	as usual	as usual	as usual	accelerated	less often	delayed	higher yield	as usual	YieldGard healthier, developes quickly, is greener and matures later, it does not fall and there are less volunteers and it is more productive than Conventional.
Spain	4440	as usual	as usual	as usual	as usual	as usual	delayed	as usual	as usual	YieldGard is greener, with more humidity and it delays a week the mturation compared to Conventional.
Spain	4441	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4442	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is healthier as it has no ECB damages and produces more than Conventional.
Spain	4443	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages, the plants and ears do not fall and it is more productive than Conventional.
Spain	4444	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because it has no ECB damages and it is more productive than Conventional.
Spain	4445	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard greener, healthier,without ECB damages, it takes longer to mature and produces more than Conventional.
Spain	4446	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, the plants and ears do not fall and it gives more kilos than Conventional.
Spain	4447	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because is resistant to ECB, it is healthier, is all harvested and produces more than Conventional.
Spain	4448	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4449	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because it has no ECB damages, is all harvested and produces more than Conventional.
Spain	4450	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4451	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4452	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4453	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is more productive than Conventional because is healthier, without ECB damages and it does not fall.
Spain	4454	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, it is healthier, the plants and ears do not fall, all is harvested and it gives more kilos than Conventional.
Spain	4455	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall and is more productive than Conventional because it has no ECB damages.
Spain	4456	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4457	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard has no ECB damages, the plants and ears do not fall and produces more than Conventional.
Spain	4458	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more prductive than Conventional because it has no ECB damages.
Spain	4459	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall, neither the plant and the ear because it is resistant to ECB, it is all harvested and produces more than Conventional.
Spain	4460	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4461	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	In the maize YieldGard the plants do not fall, neither the ears because it has no ECB damages and therefore produces more than Conventional.
Spain	4462	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages, the plants and ears do not fall, is healthier and produces more than Conventional.

Spain	4463	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4464	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4465	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is healthier, with no ECB damages,it does not fall, is all harvested and produces more than Conventional.
Spain	4466	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4467	as usual	as usual	as usual	delayed	less often	delayed	higher yield	as usual	YieldGard has no ECB damages, delays a bit the growth and maturation because it is greener, the plants and ears do not fall and produces more than Conventional.
Spain	4468	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4469	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4470	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, it is healthier, it does not fall and produces more than Conventional.
Spain	4471	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard with no ECB damages and is more productive than Conventional.
Spain	4472	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4473	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4474	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4475	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4476	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard healthier, without ECB damages, it does not fall and produces more than Conventional.
Spain	4477	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard gives more kilos than Conventional because is healthier, without ECB damages.
Spain	4478	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, is healthier and is more productive than Conventional because the plants and ears do not fall.
Spain	4479	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4480	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, it does not fall because is healthy and it is more productive than Conventional.
Spain	4481	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4482	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without damages of ECB, does not fall, there are less volunteers the next years and produces 20 % more than Conventional.
Spain	4483	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard gives more kilos because is healthier, without ECB damages.
Spain	4484	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because it has no ECB damages.
Spain	4485	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	YieldGard does not fall, it is healthier without ECB damages, there are less volunteers the next year and it gives more kilos than Conventional.
Spain	4486	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4487	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no ECB damages and is more productive than Conventional.
Spain	4488	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4489	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	

Spain	4490	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4491	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4492	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4493	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4494	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard does not fall because it has no ECB damages, it is healthier and greener and matures a bit later and produces more than Conventional.
Spain	4495	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard is resistant to ECB and does not fall, the next year there are no volunteers, is greener and matures later, is all haversted and it gives more kilos than Conventional.
Spain	4496	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is healthier, with no ECB damages, the plants and ears do not fall and produces more than Conventional.
Spain	4497	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4498	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4499	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard has no ECB damages, it does not fall and it gives more kilos than Conventional.
Spain	4500	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because is healthier because of its resistance to ECB.
Spain	4501	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4502	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4503	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4504	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4505	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, is healthier and it does not fall and it gives more kilos than Conventional.
Spain	4506	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because it does not have ECB damages, is healthier and produces more than Conventional.
Spain	4507	more vigorous	accelerated	as usual	accelerated	less often	as usual	higher yield	less often	YieldGard is more vigorous, emerges earlier, developes quickly, is healthier, without ECB damages, it does not fall and the next year there are less volunteers and produces more than Conventional.
Spain	4508	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall to the soil, neither the plants and ears, because it has no ECB damages and produces more than Conventional.
Spain	4509	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard without damages of ECB and it gives more kilos than the Conventional.
Spain	4510	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because it has no any damage of ECB.
Spain	4511	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because is resistant to ECB, it is healthier and produces more than Conventional.
Spain	4512	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because is healthier, with no ECB damages.
Spain	4513	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	En YieldGard the ears do not fall because it is healthier, without ECB damages and it gives more production than Conventional.
Spain	4514	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	

Spain	4515	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard produces more than Conventional because it has no ECB damages.
Spain	4516	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4517	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4518	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4519	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4520	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard produces more than Conventional because it has no ECB damages and it does not fall.
Spain	4521	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, does not fall, it is healthier and produces more kilos than Conventional.
Spain	4522	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages because it is resistant, it does not fall, is all harvested and gives more kilos than Conventional.
Spain	4523	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no ECB damages and produces more than Conventional.
Spain	4524	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because it is healthy, with no ECB damages.
Spain	4525	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4526	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is resistant to ECB and is healthier, produces more than Conventional.
Spain	4527	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4528	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	YieldGard produces 30 % more than Conventional because it has no ECB damages, it does not fall and there are no volunteers the next year.
Spain	4529	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4530	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard gives more kilos than Conventional because it has no ECB damages.
Spain	4531	more vigorous	as usual	as usual	accelerated	less often	delayed	higher yield	less often	YieldGard is more vigorous, grows faster, is healthier, without ECB damages, matures a bit later because is greener, it does not fall and there are no volunteers the next year and produces more than Conventional.
Spain	4532	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is healthier, without ECB damages, is more productive than Conventional.
Spain	4533	as usual	as usual	as usual	as usual	less often	delayed	higher yield	as usual	YieldGard is greener and matures a bit later, is healthier and it does not fall, has no ECB damages and produces more than Conventional.
Spain	4534	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is resistant to ECB and has no damages, is healthier and produces more than Conventional.
Spain	4535	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall, neither the plants and ears because it has no ECB damages, all is harvested and it gives more kilos than Conventional.
Spain	4536	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB and does not fall, is healthier and greener and it is more productive than Conventional.
Spain	4537	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard does not fall because it has no ECB damages, is greener and healthier and it produces more than Conventional.
Spain	4538	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4539	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard without ECB damages, the plants and ears do not fall and is more productive than Conventional.

Spain	4540	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4541	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard healthier, without ECB damages, is more productive than Conventional.
Spain	4542	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4543	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4544	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because is healthier as it has no ECB damages.
Spain	4545	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4546	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4547	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4548	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4549	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard produces more than Conventional because is healthier, without ECB damages.
Spain	4550	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4551	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4552	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4553	as usual	as usual	as usual	as usual	as usual	delayed	higher yield	as usual	YieldGard healthier, without ECB damages,greener, matures a bit later and it gives more kilos than Conventional.
Spain	4554	as usual	as usual	as usual	as usual	less often	as usual	as usual	as usual	YieldGard is resistant to ECB and it does not fall. The yield has been similar to the Conventional one because the ECB attack was very weak.
Spain	4555	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no ECB damages, is healthier than Conventional and so is more productive.
Spain	4556	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard is more productive than Conventional because it has no ECB damages.
Spain	4557	as usual	as usual	as usual	as usual	less often	delayed	higher yield	less often	YieldGard healthier because is resistant to ECB, it does not fall, is greener and matures a bit later, there are no volunteers the next year and produces more than Conventional.
Spain	4558	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB and the plants and ears do not fall and produces more than Conventional.
Spain	4559	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4560	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4561	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard is resistant to ECB, it is greener, healthier, it does not fall and gives more kilos than Conventional.
Spain	4562	as usual	as usual	as usual	as usual	less often	as usual	higher yield	as usual	YieldGard gives more kilos than Conventional because it has no ECB damages, it does not fall and is all harvested.
Spain	4563	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard has no ECB damages and is more productive than Conventional.
Spain	4564	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4565	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	YieldGard produces more than Conventional because is healthier, without ECB damages.

Spain	4566	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4567	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4568	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4569	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4570	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4571	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4572	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4573	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4574	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4575	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4576	as usual	as usual	as usual	as usual	less often	as usual	higher yield	less often	YieldGard produces more than Conventional because is resistant to ECB and it does not fall and so there are no volunteers the next year.
Spain	4577	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Spain	4578	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	
Portugal	4579	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	In this last campaign the average yields of 15 800 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize. Greater germination vigour and large sanity of Yieldgard maize plants wich provides a better production safety.
Portugal	4580	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Large sanity of Yieldgard maize plants and High germination vigour of Yieldgard maize plants. In this last campaign the average yields of 11 000 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize. The average yields in this campaign were low because of the rainy weather.
Portugal	4581	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Greater germination vigour of Yieldgard maize plants and a better quality of the Yieldgard maize. In this last campaign the average yields of 15 000 kg/ha in the Yieldgard maize, dry maize (35 ha), and the average yields of 65 000 kg/ha (50 ha) in the Yieldgard maize, forage maize, were similar compared with the conventional maize.
Portugal	4582	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	High quality of the Yieldgard forage maize. All the agronomical fields characteristics were entirely normal without nothing to report. In the last campaign the average yields of 60 000 kg/ha in the Yieldgard maize fields (forage maize) were similar compared with the conventional maize.
Portugal	4583	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	In this last campaign the average yields of 62 500 kg/ha in the Yieldgard maize, forage maize, were similar compared with the conventional maize. Greater germination vigour and Huge Sanity of Yieldgard maize plants.
Portugal	4584	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	High germination vigour, sanity and safety production of the Yieldgard maize. In this last campaign the average yields of 14 000 kg/ha in the Yieldgard maize fields, dry maize, were an average 1000 kg/ha higher in Yieldgard maize yields compared with the conventional maize. All the others field features were normal.
Portugal	4585	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	High germination vigour and huge sanity of the Yieldgard maize. In this last campaign the average yields were 14 556 kg/ha in the Yieldgard dry maize, an average of 800 -

										1000 kg/ha higher compared with conventional maize. All the others field characteristics were perfectly normal.
Portugal	4586	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Huge germination vigour and high sanity and safety production of the Yieldgard maize. In this last campaign the average yields were 12 635 kg/ha in the Yieldgard dry maize, an average of 500 / 1000 kg/ha higher compared with conventional maize.
Portugal	4587	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Excellent Sanity and Huge vigour of Yieldgard plants and good quality of the Yieldgard maize. In this last campaign the average yields were 14 000 kg/ha in the Yieldgard dry maize, an average of 800 - 1000 kg/ha higher compared with conventional maize.
Portugal	4588	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The Yieldgard plants provides a better sanity, safety production of Yieldgard maize, huge vigour of Yieldgard plants and better protection to adverse weather conditions. In this last campaign the average yields were 15 000 kg/ha in the Yieldgard dry maize, an average of 750 kg /ha higher compared with conventional maize.
Portugal	4589	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The Yieldgard maize provides a huge production safety, sanity of plants and greater vigour of Yieldgard maize plants. The average yields of 14 900 kg/ha in the Yieldgard dry maize, an average of 1000 kg/ha higher compared with conventional maize.
Portugal	4590	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	High sanity of Yieldgard maize associated to a huge vigour, high productivities and a great safety production in the Yieldgard maize fields. In that last campaign the farmer registed that the average yields of 14 760 kg/ha in the Yieldgard dry maize, were 800 - 1000 kg/ha higher compared with conventional maize.
Portugal	4591	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The Yieldgard maize provides a huge production safety and a high quality of Yieldgard maize plants. In the last campaign, the average yields of 14 800 kg/ha in the Yieldgard dry maize were an average of 500 - 800 kg/ha higher compared with conventional maize.
Portugal	4592	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	The Yieldgard maize provides a greater vigour and high productivities, huge production safety and sanity of plants of Yieldgard maize plants. The average yields of 17 750 kg/ha in the Yieldgard dry maize.
Portugal	4593	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Enormous vigour and high quality and sanity of Yielfdgard maize. In that last campaign the average yields of 15 310 kg/ha in the Yieldgard dry maize, were an average 750 kg/ha higher compared with conventional maize.
Portugal	4594	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	High vigour, excellents productivities and huge sanity and quality of Yieldgard maize. In this last campaign an average yields of 16 950 kg/ha in the Yieldgard dry maize, were an average 1000 kg/ha higher compared with conventional maize.
Portugal	4595	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Good vigour and excelent sanity of the Yieldgard maize. In that last campaign the farmer obtained an average yields of 11 500 kg/ha in the Yieldgard dry maize, were 250 - 500 kg/ha higher compared with conventional maize.
Portugal	4596	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Good quality and enormous sanity in the Yieldgard maize plants. In that last campaign the farmer registed that the average yields of 12 500 kg/ha in the Yieldgard dry maize, were an average 500 - 1000 kg/ha higher compared with conventional maize.
Portugal	4597	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The Yieldgard maize provides an enormous vigour of Yieldgard maize plants and a high sanity and production safety. The average yields of 15 200 kg/ha in the Yieldgard dry maize, an average of 750 - 1000 kg/ha higher compared with conventional maize.
Portugal	4598	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Good vigour and productivities of the Yieldgard maize fields. In that last campaign the farmer registed that the average yields of 15 000 kg/ha in the Yieldgard dry maize, were an average of 750 kg/ha higher compared with conventional maize.
Portugal	4599	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Very good productivities and excellent sanity of the Yieldgard maize. Average Yields of 14 000 kg/ha in the Yieldgard dry maize (an average of 500 kg/ha higher compared

										with conventional) and average yields of 63 500 kg/ha in the Yieldgard maize, forage maize. (an average of 1000 kg/ha higher compared with the conventional maize).
Portugal	4600	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the agronomical fields characteristics were normal without nothing to report. In the last campaign the average yields of 64 000 kg/ha in the Yieldgard maize fields (forage maize) were similar compared with the conventional maize.
Portugal	4601	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	The Yieldgard maize provides a high level of production safety, was a big added value. All the features in agronomical behaviour were completely normal. In this last campaign the average yields were 12 750 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize.
Portugal	4602	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The Yieldgard maize provides excellents productivities, huge sanity and vigour of Yieldgard maize plants. The average yields of 15 835 kg/ha in the Yieldgard dry maize, an average of 1500 kg/ha higher compared with conventional maize.
Portugal	4603	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	more often	Excellent safety production in the Yieldgard maize fields as a huge sanity and vigour of Yieldgard maize. In that last campaign the farmer registed that the average yields of 13 500 kg/ha in the Yieldgard dry maize, were 500 kg/ha higher compared with conventional maize.
Portugal	4604	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Enormous vigour and good quality of Yieldgard maize as an huge sanity of Yieldgard maize plants. In that last campaign the farmer registed that the average yields of 13 400 kg/ha in the Yieldgard dry maize, were an average of 500 kg/ha higher compared with conventional maize.
Portugal	4605	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	The Yieldgard maize provides a good vigour of Yieldgard maize plants, good quality of yieldgard maize, excellent sanity and production safety of Yieldgard maize fields. The average yields of 13 100 kg/ha in the Yieldgard dry maize, were similar compared with conventional maize.
Portugal	4606	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Less productivities in this campaign but a remarkable quality of the forage maize an added value of the yieldgard maize. In this last campaign the average yields of 55 000 kg/ha in the Yieldgard forage maize were similar compared with the conventional maize.
Portugal	4607	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the agronomical fields characteristics were normal without nothing to report. In the last campaign the average yields of 58 000 kg/ha in the Yieldgard maize fields (forage maize) were similar compared with the conventional maize. Good quality of the Yieldgard forage maize.
Portugal	4608	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	The great advantage of the Yieldgard maize plants was the production safety of Yieldgard maize fields and their sanity. In this last campaign the average yields of 13 200 kg/ha in the Yieldgard maize, dry maize, and the average yields of 66 700 kg/ha in the Yieldgard maize, forage maize, were similar compared with the conventional maize.
Portugal	4609	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	Huge vigour, good quality and high sanity of Yieldgard maize. In that last campaign the farmer registed that the average yields of 11 750 kg/ha in the Yieldgard dry maize, were 300 - 600 kg/ha higher compared with conventional maize.
Portugal	4610	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the features in agronomical behaviour were completely normal. In this last campaign the average yields were 13 000 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize. Good quality and high sanity in the Yieldgard maize plants.
Portugal	4611	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	High vigour and sanity of Yieldgard maize fields. In this last campaign the average yields of 14 250 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize.

Portugal	4612	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the features in agronomical behaviour were completely normal. In this last campaign the average yields of 67 500 kg/ha in the Yieldgard maize, forage maize, were similar compared with the conventional maize. An agressive year of rain and wind in the region of production which affected the productivities.
Portugal	4613	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	It was an agressive year of rain and wind in the region of production. All the features in agronomical behaviour were completely normal. In this last campaign the average yields of 70 000 kg/ha in the Yieldgard maize, forage maize, were similar compared with the conventional maize.
Portugal	4614	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the features in agronomical behaviour were normal. In this last campaign the average yields of 57 500 kg/ha in the Yieldgard maize, forage maize, were similar compared with the conventional maize.
Portugal	4615	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	It was an agressive year of rain and wind in the region of production. Many maize felt to the ground because of the strong wind and agressive weather which affected the productivities.Very good sanity of Yieldgard maize fields. In that last campaign the farmer registed that the average yields of 13 500 kg/ha in the Yieldgard dry maize, were 500 kg/ha higher compared with conventional maize.
Portugal	4616	more vigorous	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	The Sanity and production safety of Yieldgard maize fields were high and remarkable. In this last campaign the average yields of 12 600 kg/ha in the Yieldgard maize were 250 - 500 kg/ha higher compared with the conventional maize, dry maize.
Portugal	4617	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	High vigour and a good Quality of Yieldgard maize. Good Sanity! In this last campaign the average yields of 12 200 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize.
Portugal	4618	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Good quality of the yieldgard maize. All the features in agronomical behaviour were completely normal. In this last campaign the average yields were 12 600 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize.
Portugal	4619	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the features in agronomical behaviour were completely normal. In this last campaign the average yields of 12 800 kg/ha in the Yieldgard maize, dry maize, and the average yields of 54 000 kg/ha in the Yieldgard maize, forage maize, were similar compared with the conventional maize. High Sanity of Yieldgard maize.
Portugal	4620	more vigorous	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Great Sanity, Quality, vigour and safety production of Yieldgard maize plants. In this last campaign the average yields of 16 200 kg/ha in the Yieldgard maize, dry maize.
Portugal	4621	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	Good Quality of the Yieldgar dry maize. All the field characteristics and agronomical behaviour were normal. In this last campaign the average yields of 12 600 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize.
Portugal	4622	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the agronomical fields characteristics were entirely normal. In the last campaign the average yields of 11 800 kg/ha in the Yieldgard maize fields (dry maize) were similar compared with the conventional maize.
Portugal	4623	as usual	as usual	as usual	as usual	as usual	as usual	higher yield	as usual	All the characteristics and agronomical behaviour were completely normal. Huge safety protection of the Yieldgard maize plants. In this last campaign the average yields of 14 500 kg/ha in the Yieldgard maize, dry maize, were 500 kg/ha higher compared with the conventional maize and an average yields of 56 000 kg/ha in the Yieldgard maize.
Portugal	4624	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the agronomical fields characteristics were entirely normal without nothing to report. In the last campaign the average yields were 15 500 kg/ha in the Yieldgard maize fields (dry maize). Great Sanity and Quality of the Yieldgard maize.
Portugal	4625	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the agronomical fields characteristics were entirelly normal. In the last campaign the average yields of 12 000 kg/ha in the Yieldgard maize fields (dry maize) were similar compared with the conventional maize. High production safety with the

										Yieldgard maize.
Portugal	4626	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	In this last campaign the average yields were 12 750 kg/ha in the Yieldgard maize, dry maize, were similar compared with the conventional maize. The great advantage of the Yieldgard maize were the huge protection Safety provided. All the features in agronomical behaviour were completely normal.
Portugal	4627	as usual	as usual	as usual	as usual	as usual	as usual	as usual	as usual	All the agronomical fields characteristics were entirelly normal. In the last campaign the average yields of 13 250 kg/ha in the Yieldgard maize fields (dry maize) were similar compared with the conventional maize. High production safety and sanity with the Yieldgard maize.

Table A 9: Additional observation during plant growth of MON 810 (Section 0)

Country	Quest. Nr.	Comments aggregate	Comments
Spain	4428	Climatology very adverse	The climatology has been very adverse and there were no differences between YieldGard and Conventional.
Spain	4370	No corn borer in 2015	This year there was no ECB attack.
Spain	4376		This year there was no ECB attack.
Spain	4379		This year there was no ECB attack.
Spain	4381		There was little ECB in the area this season.
Spain	4390		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4402		There was no ECB and no differences between YieldGard and Conventional were seen.
Spain	4405		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4406		There are no differences between YieldGard and Conventional because there was no ECB attack.
Spain	4417		There are no differences between YieldGard and Conventional because there was no ECB attack in 2015.
Spain	4421		There are no differences between YieldGard and Conventional because there was no ECB attack in 2015.
Spain	4426		There are no differences between YieldGard and Conventional because there was no ECB attack.
Spain	4427		When there is no ECB, there are no differences between YieldGard and Conventional.
Spain	4429		There was no ECB attack and so no differences between YieldGard and Conventional are seen.
Spain	4430		There was no ECB and no differences between YieldGard and Conventional are seen.
Spain	4432		There are no differences between YieldGard and Conventional because there was no ECB attack this season.
Spain	4434		There was no ECB attack in the area and no no differences between YieldGard and Conventional are seen.
Spain	4435		There were no differences between YieldGard and Conventional because there was no ECB attack in the area in 2015.
Spain	4448		When there is little ECB no differences between YieldGard and Conventional were seen.
Spain	4451		There was no ECB plague and no differences between YieldGard and Conventional are seen.
Spain	4452		There are no differences between YieldGard and Conventional if there is no ECB attack.
Spain	4460		There was no ECB attack in the area this season.
Spain	4466		There are no differences between YieldGard and Conventional because there was no ECB attack.
Spain	4472		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4474		There was no ECB attack this year and there are no differences between YieldGard and Conventional.
Spain	4488		When there is no ECB there are no differences between YieldGard and Conventional.
Spain	4490		There were no differences between YieldGard and Conventional because there was no ECB attack in the area.
Spain	4493		There are no differences between YieldGard and Conventional because there was no ECB attack in 2015.
Spain	4498		No differences between YieldGard and Conventional are seen because there was no ECB attack in the area.
Spain	4501		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4502		No differences between YieldGard and Conventional are seen because there was no ECB attack in 2015.
Spain	4514		The years when there is no ECB attack, there are no differences between YieldGard and Conventional.
Spain	4516		When there is no ECB there are no differences between YieldGard and Conventional.
Spain	4517		There was no ECB and there are no differences between YieldGard and Conventional.
Spain	4525		There was very little ECB and no differences between YieldGard and Conventional were seen.
Spain	4529		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4540		When there is no ECB attack no differences between YieldGard and Conventional are seen.
Spain	4543		When there is no ECB attack no differences between YieldGard and Conventional are seen.

Spain	4547		There was no ECB attack in 2015 and no differences between YieldGard and Conventional are seen.
Spain	4550		When there is no ECB attack there are no differences between YieldGard and Conventional.
Spain	4552		There are no differences between YieldGard and Conventional because there was no ECB attack.
Spain	4560		When there is no ECB no differences between YieldGard and Conventional are seen.
Spain	4566		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4567		No differences between YieldGard and Conventional are seen because there was no ECB attack in the area this season.
Spain	4569		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4571		There was no ECB and there are no differences between YieldGard and Conventional.
Spain	4577		There was no ECB attack and there are no differences between YieldGard and Conventional.
Spain	4578		There was no ECB attack in the area and no differences between YieldGard and Conventional are seen.
Spain	4368	YieldGard has higher humidity	YieldGard has more humidity and matures later than Conventional.
Spain	4386		The grain of YieldGard has a bit more humidity than the Conventional one.
Spain	4387		YieldGard is greener, with more humidity than Conventional.
Spain	4391		YieldGard has two degrees more of humidity than Conventional.
Spain	4413		YieldGard has two or three degrees more oh humidity than the Conventional.
Spain	4431		YieldGard has one or two degrees more of humidity than the Conventional.
Spain	4439		YieldGard has more humidity than the Conventional.
Spain	4440		YieldGard has one degree or two more than the Conventional of humidity.
Spain	4467		YieldGard has one or two degrees more of humidity than the Conventional.
Spain	4478		YieldGard has more humidity than the Conventional when harvesting.
Spain	4553		YieldGard has one or two degrees more of humidity than the Conventional.
Spain	4575		YieldGard has a bit more of humidity than the Conventional.

Table A 10: Additional comments on disease susceptibility (Section 3.4.3)

Country	Quest. Nr.	Disease susceptibility	Comments aggregate	Comments
Portugal	4587	as usual	No difference	The farmer noted a similar susceptibility on diseases of the Yieldgard maize in this campaign despite the historical high presence in the region of production of Cefalosporium.
Portugal	4612	as usual	No difference due to low disease pressure	Non-existent in the region of production, difficult to analyse the susceptibility on diseases.
Portugal	4613	as usual		Non-existent in the region of production, difficult to analyse the susceptibility on diseases.
Portugal	4614	as usual		Non-existent in the region of production, difficult to analyse the susceptibility on diseases.
Portugal	4579	less susceptible	YieldGard less susceptible in general	The largest sanity of Yieldgard maize and better production safety allows / provides to the Yieldgard maize plants more resistant to the others diseases (less susceptible to diseases). High presence in the local / region of production of different diseases.
Portugal	4580	less susceptible		The farmer noted an indirectly less susceptibility on diseases of the Yieldgard maize in this campaign provided by the large sanity of Yieldgard plants
Portugal	4581	less susceptible		Provided by the large quality and sanity of Yieldgard plants the farmer noted an indirectly less susceptibility on diseases of the Yieldgard maize in this campaign.
Portugal	4582	less susceptible		The Yieldgard maize provides a better safety production to the farmer and so the Yieldgard maize plants had a better indirect capacity resistant to the diseases (less susceptible to diseases).
Portugal	4583	less susceptible		Yieldgard maize plants were more resistant to the diseases (less susceptible to diseases), the farmer justified the less susceptible to diseases), the farmer justified the less susceptibility on diseases because the Huge Sanity of the Yieldgard maize.
Portugal	4598	less susceptible		Yieldgard maize plants were a little more resistant to the attack of diseases (a little less less susceptible to diseases).
Portugal	4603	less susceptible		The Yieldgard maize plants had a better indirect capacity resistant to the diseases provided by the excellent safety production in the Yieldgard maize fields as a huge sanity and vigour of Yieldgard maize.
Portugal	4605	less susceptible		The excellent sanity and production safety of Yieldgard maize plants provided more resistant to the attack of diseases (less susceptible to diseases).
Portugal	4604	less susceptible	YieldGard less susceptible to Cephalosporium spp	Yieldgard maize plants were more resistant to the attack of diseases like Cefalosporium.spp. The farmer justified the less susceptibility on diseases because the greater vigour and the huge sanity of the Yieldgard maize.
Spain	4505	less susceptible	YieldGrad less susceptible to Ustilago	YieldGard is healthier, without ECB damages and it has less Ustilago attack than Conventional. YieldGard has less Ustilago attack than Conventional because it has no ECB damages and the fungi cannot penetrate.
Spain	4524	less susceptible		YieldGard is healthier than Conventional and it does not have Ustilago attack, the Conventional does. YieldGard without damages caused by the ECB attack and the fungi Ustilago cannot penetrate into the plant.

Table A 11: Additional comments on insect pest control (Section 0)

Country	Quest. Nr.	Ostrinia nubilalis	Sesamia spp.	Comments
Portugal	4584	very good	very good	Excellent Global Effectiveness!
Portugal	4592			Fantastic / Amazing control in the Yieldgard Maize

Table A 12: Additional comments on pest susceptibility (Section 3.4.5)

Country	Quest. Nr.	Pest susceptibility	Order of insect pest	Comments aggregate	Comments
Portugal	4613	as usual		No differences	Despite the region of production had an higher incidence of pests attacks in this last campaign the farmer had nothing to report about differences in pests susceptibility.
Portugal	4611	as usual		No pest pressure	The region of production had a quite lower incidence of pests attacks. Nothing to report.
Portugal	4598	as usual	Agrotis Ipsilon, Spodoptera Frugiperda	YieldGard more resistant in general	The sanity of the Yieldgard is remarkable and evident and so provided more resistant from the attack of the diferent other pests like Agrotis Ipsilon.
Spain	4433	as usual	Mythimna spp. (Mitima)	YieldGard more resistant to Mythimna	When there is plague of Mythimna only attacks Conventional, never the YieldGard.
Spain	4534	as usual	Spodoptera exigua	YieldGard more resistant to Spodoptera	YieldGard has less attack of Spodoptera than Conventional.
Spain	4528	less susceptible	Thysanoptera	Less Thysonoptera attacks in YieldGard	There is more attack of Thrips in Conventional than in YieldGard, Maize YieldGard is healthier.
Portugal	4580	less susceptible	Agrotis Ipsilon	YieldGard more resistant in general	Yieldgard maize plants were more resistant to the others pests (less susceptible to diseases), justified based in the Large Sanity of the Yieldgard Maize.
Portugal	4581	less susceptible	Agrotis Ipsilon		Provided by the large quality and sanity of Yieldgard plants the Yieldgard maize plants were more resistant to the others pests (less susceptible to diseases)
Portugal	4583	less susceptible	Agrotis Ipsilon		Yieldgard maize plants were indirectly more resistant to the others pests (less susceptible to other pests) justified by the greater vigour and sanity of the Yieldgard maize.
Portugal	4601	less susceptible	Agrotis Ipsilon		The sanity of Yieldgard maize and the high level of safety production were the reasons why the Yieldgard plants were a little less susceptible from the attacks of other pests.
Portugal	4605	less susceptible	Agrotis Ipsilon		The fact that the Yieldgard maize was resistant to the attack of the maize borer pest made indirectly the Yieldgard plants less susceptible (more resistant) from the attacks of other pests like Agrotis Ipsilon.
Portugal	4606	less susceptible	Agrotis Ipsilon		The excellent and high sanity of the Yieldgard maize provided a little more resistant from the attack of the diferent other pests.
Portugal	4607	less susceptible	Agrotis Ipsilon		The sanity of the Yieldgard maize provided more resistant from the attack of the diferent other pests.
Portugal	4608	less susceptible	Agrotis Ipsilon		Despite the region of production had a lower incidence of pests, the plots of Yieldgard maize were a little more resistant to the attack of different other pests like Agrotis Ipsilon.
Portugal	4610	less susceptible	Agrotis Ipsilon		The sanity and the safety production of Yieldgard maize were the main reasons for the Yieldgard plants were less susceptible from the attacks of other pests.
Portugal	4615	less susceptible	Agrotis Ipsilon		The sanity, quality and the safety production of Yieldgard maize were the great advantages and the main reasons for the Yieldgard plants were less susceptible from the attacks of other pests.
Portugal	4620	less susceptible	Agrotis Ipsilon		The sanity of the Yieldgard maize provided more resistant from the attack of the diferent other pests like agrotis Ipsilon.
Portugal	4622	less susceptible	Agrotis Ipsilon		The farmer noted in this campaign that the Yieldgard maize provided a little resistant from the attack of other pests like Agrotis Ipsilon.
Portugal	4627	less susceptible	Agrotis Ipsilon		The plots of Yieldgard maize were also attacked by other pests but in general the Yieldgard maize was less susceptible to the attack of those different other pests like Agrotis Ipsilon.
Portugal	4612	less susceptible	Agrotis Ipsilon, Agriotes spp.		In this last campaign the region of production had an higher incidence level of pests like Agrotis and Agriotes. So the farmer noted that the Yieldgard maize fields were more protected against the

				attack of those other pests.
Portugal	4618	less susceptible	Agrotis Ipsilon, Agriotes spp.	In this last campaign the region of production had a Higher incidence of pests. The Sanity of Yieldgard maize provides more resistant to the attack of different other pests.
Portugal	4588	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	Yieldgard maize high sanity and huge production safety provides to the Yieldgard maize fields more resistant and better protection to the attack of others pests.
Portugal	4591	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The fantastic sanity of the Yieldgard maize provided a little more resistant from the attack of the diferent other pests.
Portugal	4592	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	Yieldgard maize huge production safety was remarkable and provides to the Yieldgard maize fields more resistant and better protection to the attack of others pests.
Portugal	4593	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The sanity and the safety production of Yieldgard maize were the reasons why the Yieldgard plants were less susceptible (more resistant) from the attacks of other pests.
Portugal	4594	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The better sanity of the Yieldgard maize provided a better resistant from the attack of the diferent other pests.
Portugal	4595	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The excellent sanity of the Yieldgard maize provided a little more resistant from the attack of the diferent other pests.
Portugal	4596	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The fact that the Yieldgard maize was resistant to the attack of the maize borer pest provides to the Yieldgard plants less susceptible (more resistant) from the attacks of other pests.
Portugal	4597	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The high and amazing sanity of the Yieldgard maize provided more resistant from the attack of the diferent other pests.
Portugal	4599	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The sanity and the quality of the Yieldgard maize are the main reasons of the better resistant from the attack of the diferent other pest.
Portugal	4603	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The sanity of the Yieldgard maize was the reason and an added value wich provided more resistant from the attack of the diferent other pests.
Portugal	4616	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The sanity of the Yieldgard maize provided more resistant from the attack of the diferent other pests.
Portugal	4617	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The sanity and quality of Yieldgard maize were the main reasons for the Yieldgard plants were less susceptible from the attacks of other pests.
Portugal	4619	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The region of production had a Higher incidence of pests in this last campaign. The huge sanity of Yieldgard maize were important for the less susceptible from the attacks of other pests.
Portugal	4623	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The high sanity and safety production of Yieldgard maize were the great advantages and the main reasons for the Yieldgard plants were less susceptible from the attacks of other pests.
Portugal	4624	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The fact that the Yieldgard maize was resistant to the attack of the maize borer pest made indirectly the Yieldgard plants less susceptible (more resistant) from the attacks of the Yieldgard plants less susceptible (more resistant) from the attacks of other pests.other pests like Agrotis Ipsilon.
Portugal	4625	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The plots of Yieldgard maize were also attacked by other pests but in general the Yieldgard maize was less susceptible to the attack of those different other pests.
Portugal	4626	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda	The great advantages of the Yieldgard maize like the huge sanity and production safety provided a little more resistant (less susceptibile) from the attack of the diferent other pests.
Portugal	4584	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.	Yieldgard maize was mostly more resistant to the attack of the different other pests. The reason for that was the high sanity of the Yieldgard maize.
Portugal	4585	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.	The sanity of Yieldgard, dry maize, and the safety production made all the difference and provides indirectly that the Yieldgard plants were less susceptible (more resistant) from the attacks of other pests.

Portugal	4586	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.		The sanity of Yieldgard maize and the safety production were the reasons why the Yieldgard plants were less susceptible (more resistant) from the attacks of other pests.
Portugal	4587	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.		The fact that the Yieldgard maize was resistant to the attack of the maize borer pest made the Yieldgard plants less susceptible (more resistant) from the attacks of other pests.
Portugal	4589	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.		The high sanity of the Yieldgard plants and the fact of the Yieldgard maize was resistant to the attack of the maize borer pest made the Yieldgard plants less susceptible (more resistant) from the attacks of other pests.
Portugal	4590	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.		The amazing sanity of the Yieldgard maize provided more resistant from the attack of the diferent other pests. It was a great advantage of the Yieldgard maize fields.
Portugal	4602	less susceptible	Agrotis Ipsilon, Spodoptera Frugiperda, Tetranychus spp.		The Yieldgard maize provides a high level of production safety, was a big added value and a high sanity of the Yieldgard plants
Portugal	4579	less susceptible	Agrotis Ipsilon, Tetranychus spp.		Despite the Yieldgard event was specific for the control of maize borer the Yieldgard plants were less susceptible (more resistant) from the attacks of other pests because the high sanity of Yieldgard plants.
Portugal	4582	less susceptible	Agrotis Ipsilon, Tetranychus spp.		Yieldgard maize plants were more resistant to the others pests, justified based in the Large Sanity and Safety Production of the Yieldgard Maize.
Portugal	4604	less susceptible	Agrotis Ipsilon, Tetranychus spp.		The amazing sanity of Yieldgard plants provided a little more resistant from the attack of the diferent other pests.
Portugal	4609	less susceptible	Tetranychus spp.		The sanity of the Yieldgard maize provided more resistant from the attack of the diferent other pests.
Spain	4487	less susceptible	Heliothis	YieldGard more resistant to Heliothis	YieldGard is healthier and has no Heliothis attack but the Conventional has it.
Spain	4540	less susceptible	Heliothis		There is no attack of Heliothis in YieldGard but there is attack in Conventional.
Spain	4425	less susceptible	Mythimna spp. (Mitima)	YieldGard more resistant to Mythimna	Conventional has more attack of Mythimna than YieldGard.
Spain	4427	less susceptible	Mythimna spp. (Mitima)		YieldGard has no Mythimna attack and the Conventional has it.
Spain	4436	less susceptible	Mythimna spp. (Mitima)		YieldGard has no Mythimna attack and the Conventional has it.
Spain	4437	less susceptible	Mythimna spp. (Mitima)		When there is attack of Mythimna there is higher presence of the plague in Conventional than in YieldGard.
Spain	4556	less susceptible	Mythimna spp. (Mitima)		YieldGard has less Mythimna attack than Conventional.
Spain	4371	less susceptible	Red Spider	YieldGard more resistant to Red Spider	In YieldGard there are less attacks of Red spiders than in Conventional.
Spain	4377	less susceptible	Red Spider		YieldGard is healthier and has less attacks of Red spiders than the Conventional.
Spain	4531	less susceptible	Red Spider, Heliothis		There is less attack of Red spider and Heliothis in YieldGard than in Conventional.
Spain	4431	less susceptible	Spodoptera exigua	YieldGard more resistant to Spodoptera	Spodoptera attacks much more to the Conventional maize than to the YieldGard.
Spain	4532	less susceptible	Spodoptera exigua		There is less attack of Spodoptera in YieldGard than in Conventional.
Spain	4533	less susceptible	Spodoptera exigua		Conventional has attack of Spodoptera and the YieldGard has not.

Table A 13: Weeds that occurred in MON 810 (Section 3.4.6)

Name of weed	Frequency
Sorghum halepense	164
Abutilon theophrasti	111
Chenopodium album	88
Setaria spp.	69
Amaranthus retroflexus	65
Xanthium strumarium	47
Cyperus spp.	42
Portulaca oleracea	31
Datura stramonium	27
Echinochloa spp.	27
Solanum nigrum	25
Digitaria sanguinalis	21
Phragmites australis	12
Echinochloa crus-galli	12
Raphanus raphanistrum	10
Cynodon dactylon	8
Xanthium spinosum	5
Polygonum persicaria	4
Amaranthus spp.	4
Polygonum convolvulus	3
Cirsium arvense	2
Diplotaxis erucoides	2
Malva spp.	1
Hordeum vulgare	1
Pisum sativum	1

Table A 14: Specifications for the performance of animals fed MON 810 (Section 3.4.8)

Country	Quest. Nr.	Performance of the animals fed MON 810	Comments on animal performance
Portugal	4581	as usual	Completely normal the growth and development of animals fed with Yieldgard maize.
Portugal	4582		
Portugal	4583		
Portugal	4599		
Portugal	4600		
Portugal	4606		
Portugal	4607		
Portugal	4608		
Portugal	4612		
Portugal	4613		
Portugal	4614		
Portugal	4626		

Table A 15: Motivations for not complying with the label recommendations (section 3.5.2)

Country	Quest. Nr.	Compliance	Reasons
Spain	4404	no	I did not sow refuge because yield can be lost in the Conventional by ECB damages.
Spain	4408		I have small plots and I did not sow refuge.
Spain	4415		ECB produces me lots of losses of harvest and I did not sow Conventional as refuge.
Spain	4429		I have small plots and I did not sow refuge because it complicates me the sowing.
Spain	4471		I did not sow refuge because ECB produces lots of harvest losses.
Spain	4474		I did not sow refuge because ECB produces lots of harvest losses.
Spain	4503		To sow refuge complicates me the sowing.
Spain	4538		I do not sow refuge with Conventional because ECB would cause me lots of harvest losses.
Spain	4562		I did not sow refuge because I have small plots and the ECB causes lots oh harvest losses.
Spain	4563		I did not sow refuge because I do not want to have harvest losses.
Spain	4566		Because if I sow Conventional for the refuge, it would produces me lots of harvest losses.
Spain	4568		If I sow Conventional as refuge I have harvest losses if there is ECB attack.

Table A 16: Motivations for not planting a refuge (section 3.5.3)

Country	Quest. Nr.	Plant refuge?	Reasons
Spain	4404	no	Because I would have harvest losses because of the ECB attack.
Spain	4408		Because I have small plots, it complicates me the sowing and the ECB makes me lose harvest in the Conventional.
Spain	4415		ECB causes me lots of harvest losses if I sow Conventional maize.
Spain	4429		I have small plots and it complicates me the sowing.
Spain	4471		ECB damages in Conventional reduce the yield.
Spain	4474		Because in late sowings ECB causes harvest losses in Conventional maize.
Spain	4503		Because is not mandatory and it complicates me the sowing.
Spain	4538		ECB causes lots of harvest losses in Conventional maize.
Spain	4562		Because I have small plots, it complicates me the sowing and for not having harvest losses by ECB damages in the Conventional maize.
Spain	4563		Because ECB causes lots of harvest losses in Conventional maize.
Spain	4566		Because ECB would cause me lots of harvest losses on the refuge of Conventional maize.
Spain	4568		ECB causes harvest losses in the Conventional maize of the refuge.
Portugal	4592		Didn´t plant a refuge because the field of prodution was "in a production area " and opted to do not plant a refuge. The farmer had no legal requirement to do.
Portugal	4600		Didn´t plant a refuge because the field of prodution was "in a production area " and opted to do not plant a refuge. The farmer had no legal requirement to do.
Portugal	4620		Didn´t plant a refuge because the field of prodution was "in a production area " and decided to didn´t plant a refuge. The farmer had no legal requirement to do.
Portugal	4624		Didn´t plant a refuge because the field of prodution was "in a production area " and decided to didn´t plant a refuge. The farmer had no legal requirement to do.

7 B Questionnaire

2	0	1	5	-	0	1	-	M	A	R	-	E	S	-	0	1	-	0	1	-	0	1

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.

Code:

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

Farmer ☐☐ Area ☐☐

Coding explanations:

2	0	1	3	-	0	1	-	M	A	R	-	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 ...

Partner[7]: MON Monsanto
MAR Markin
AGR Agro.Ges
... ...

Country: ES Spain
PT Portugal
RO Romania
…

Interviewer[8]: 01 A
02 B
03 …

Farmer: incremental counter within the interviewer

Area: incremental counter within the farmer

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[7] Partner is the organization that implements the survey
[8] Interviewer is the employee from the Partner that is contacting the farmers

2	0	1	5	-	0	1	-	M	A	R	-	E	S	-	0	1	-	0	1	-	0	1

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?[9]

O Yes O No

[9] Note: This question does not need to be asked in the 2013 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)

8 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: ______________________________

2	0	1	5	-	0	1	-	M	A	R	-	E	S	-	0	1	-	0	1	-	0	1

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

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 2013, 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 2013, did you change maize borer control practices in YieldGard® maize when compared to conventional maize?

O Similar O Changed, because:____________________________

In 2013, how were the fertilizer application practices in YieldGard® maize when compared to conventional maize?

O Similar O Changed, because:____________________________

In 2013, 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 vigourous	O Less vigourous
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[10] 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

[10] 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 ____
____
____
____