524-576 7/2/2013 1/23

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, D.C. 20460

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OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

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1300 I Street, NW, Suite 450 East
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Re: MON 89034 x MON 88017
EPA Registration No. 524-576
Amendment to label and conditions of registration
Submission dated 03/26/2013
Decision No. 477187

The amendment referred to above, submitted in connection with registration under Section 3(c)(7)(A) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), is acceptable only as an extension to the current conditional, time-limited registration and provided that you comply with the updated terms and conditions as described in this letter.

1) The subject registration will automatically expire on midnight September 30, 2015.

2) The subject registration will be limited to MON 89034 x MON 88017 [*Bacillus thuringiensis* Cry1A.105 and Cry2Ab2 proteins and the genetic material necessary for their production (vector PV-ZMIR245) in MON 89034 corn (OECD Unique Identifier: MON-89034-3) x *Bacillus thuringiensis* Cry3Bb1 protein and the genetic material necessary for its production (vector PV-ZMIR39) in MON 88017 corn (OECD Unique Identifier: MON-88Ø17-3) for use in field or sweet corn.]

3) Submit/cite all data required for registration of your product under FIFRA § 3(c)(5) when the Environmental Protection Agency (EPA) requires registrants of similar products to submit such data.

4) This plant-incorporated protectant may be combined through conventional breeding with other registered plant-incorporated protectants that are similarly approved for use in combination, through conventional breeding, with other registered plant-incorporated protectants to produce inbred corn lines and hybrid corn varieties with combined pesticidal traits.

5) You must commit to implement an Insect Resistance Management (IRM) Program, consisting of the following elements:

- Requirements relating to creation of a refuge for the Cry3Bb1, Cry1A.105, and Cry2Ab2 components that meets the requirements of the individual traits. The refuge for both traits may be combined by planting non-*Bacillus thuringiensis* (*Bt*) corn as the refuge, or the refuge for each trait may be planted separately. In the latter case, corn rootworm-resistant *Bt* corn may be planted in the lepidopteran refuge for the Cry1A.105 and Cry2Ab2 components, and lepidopteran-resistant *Bt* corn may be planted in the corn rootworm refuge for the Cry3Bb1 component.

- Requirements (except for sweet corn home garden or educational use, i.e., marketed to home gardeners or educators for use on less than 20 acres) for Monsanto to prepare and require MON 89034 x MON 88017 users to sign "grower agreements," that impose binding contractual obligations on the grower to comply with the refuge requirements.

- Requirements for Monsanto to develop, implement and report to EPA on programs to educate growers about IRM requirements.

- Requirements for Monsanto to develop, implement and report to EPA on programs to evaluate and promote growers' compliance with IRM requirements (except for sweet corn home garden or educational use, i.e., marketed to home gardeners or educators for use on less than 20 acres).

- Requirements for Monsanto to develop, implement and report to EPA on programs to evaluate whether there are statistically significant and biologically relevant changes in target insect susceptibility to Cry1A.105, Cry2Ab2, and Cry3Bb1 proteins in the target insects.

- Requirements for Monsanto to develop and, if triggered, to implement a "remedial action plan" that contains measures Monsanto would take in the event that any field relevant insect resistance was detected as well as to report on activity under the plan to EPA.

- Requirements (except for sweet corn home garden use or educational use, i.e., marketed to home gardeners or educators for use on less than 20 acres) for Monsanto to maintain, and provide the Agency upon request, the number of units sold by state and county, IRM grower agreement results, and substantive changes to educational programs, for the previous growing season, within three months of the request.

- Requirements for Monsanto, on or before August 31st of each year, to submit reports on resistance monitoring.

- For MON 89034 × MON 88017 Sweet Corn Home Garden or Educational Use: Requirements for Monsanto to, upon EPA request, submit a report on the estimated number of acres planted by state or county level, for the previous growing season, within three months of the request.

a) Refuge Requirements for MON 89034 x MON 88017 Field Corn

These refuge requirements do not apply to seed increase/propagation of inbred and hybrid seed corn up to a total of 20,000 acres per county and up to a combined United States (U.S.) total of 250,000 acres per plant-incorporated protectant (PIP) active ingredient per registrant per year. Furthermore, these refuge requirements do not apply to commercial hybrid sweet corn.

When on-farm assessments identify non-compliance with refuge requirements for one or more *Bt* corn products, additional educational material and assistance are provided by the registrant to help these growers meet the

refuge requirements across their farming operations.

Grower agreements (also known as stewardship agreements) will specify that growers must adhere to the refuge requirements as described in the grower guide/product use guide and/or in supplements to the grower guide/product use guide.

1) Corn-Belt Refuge Requirements

For MON 89034 x MON 88017 field corn grown outside cotton-growing areas (e.g., the Corn Belt), grower agreements (also known as stewardship agreements) will specify that growers must adhere to the refuge requirements as described in the grower guide/product use guide and/or in supplements to the grower guide/product use guide. Two options for the deployment of the refuge are available to growers.

The first option is planting a common refuge for both corn borers and corn rootworms. The common refuge must be planted with corn hybrids that do not contain *Bt* technologies for the control of corn rootworms or corn borers. The refuge area must represent at least 20% of the grower's corn acres (i.e., sum of MON 89034 x MON 88017 acres and refuge acres). It must be planted as a block adjacent to the MON 89034 x MON 88017 field, perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The common refuge may be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge may also be treated with a non-*Bt* foliar insecticide for control of late season pests if pest pressure reaches an economic threshold for damage (determined using methods recommended by local or regional professionals); however, if rootworm adults are present at the time of foliar applications, then the MON 89034 x MON 88017 field must be treated in a similar manner.

The second option is planting separate refuge areas for corn borers and corn rootworms. The corn borer refuge must be planted with a non-*Bt*/lepidopteran-protected hybrid, must represent at least 5% of the grower's corn acres (i.e. sum of MON 89034 x MON 88017 acres and corn borer refuge acres), and must be planted within ½ mile of the MON 89034 x MON 88017 field. Refuge planting options include: separate fields, blocks within fields (e.g., along the edges or headlands), perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn borer refuge may be treated with a soil-applied or seed-applied insecticide for corn rootworm larval control or a non-*Bt* foliar-applied insecticide for corn borer control if pest pressure reaches an economic threshold for damage (determined using methods recommended by local or regional professionals). The corn rootworm refuge must be planted with a non-*Bt*/corn rootworm-protected hybrid but may be planted with *Bt* corn hybrids that control corn borers. The corn rootworm refuge must represent at least 20% of the grower's corn acres (i.e. sum of MON 89034 x MON 88017 acres and corn rootworm refuge acres) and must be planted as an adjacent block, perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn rootworm refuge may be treated with a soil-applied or seed- applied insecticide to control rootworm larvae and other soil pests. The refuge may also be treated with a non-*Bt* foliar insecticide for control of late season pests; however, if rootworm adults are present at the time of foliar applications, then the MON 89034 x MON 88017 field must be treated in a similar manner.

2) Cotton-Growing Area Refuge Requirements

For MON 89034 x MON 88017 field corn grown in cotton-growing areas, grower agreements (also known as stewardship agreements) will specify that growers must adhere to the refuge requirements as described in the grower guide/product use guide and/or in supplements to the grower guide/product use guide.

Cotton-growing areas include the following states: Alabama, Arkansas, Georgia, Florida, Louisiana, North Carolina, Mississippi, South Carolina, Oklahoma (only the counties of Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman, Washita), Tennessee (only the counties of Carroll, Chester,

Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby, and Tipton), Texas (except the counties of Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts, and Sherman), Virginia (only the counties of Dinwiddie, Franklin City, Greensville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey, Sussex), and Missouri (only the counties of Dunklin, New Madrid, Pemiscot, Scott, and Stoddard).

Two options for the deployment of the refuge are available to growers.

The first option is planting a common refuge for both corn borers and corn rootworms. The common refuge must be planted with corn hybrids that do not contain *Bt* technologies for the control of corn rootworms or corn borers. The refuge area must represent at least 20% of the grower's corn acres (i.e. sum of MON 89034 x MON 88017 acres and refuge acres). It must be planted as a block adjacent to the MON 89034 x MON 88017 field, perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The common refuge may be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge may also be treated with a non-*Bt* foliar insecticide for control of late season pests if pest pressure reaches an economic threshold for damage (determined using methods recommended by local or regional professionals); however, if rootworm adults are present at the time of foliar applications, then the MON 89034 x MON 88017 field must be treated in a similar manner.

The second option is planting separate refuge areas for corn borers and corn rootworms. The corn borer refuge must be planted with a non-*Bt*/lepidopteran-protected hybrid, must represent at least 20% of the grower's corn acres (i.e. sum of MON 89034 x MON 88017 acres and corn borer refuge acres), and must be planted within ½ mile of the MON 89034 x MON 88017 field.

Refuge planting options include: separate fields, blocks within fields (e.g., along the edges or headlands), perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn borer refuge may be treated with a soil- applied or seed-applied insecticide for corn rootworm larval control or a non-*Bt* foliar-applied insecticide for corn borer control if pest pressure reaches an economic threshold for damage (determined using methods recommended by local or regional professionals). The corn rootworm refuge must be planted with a non-*Bt*/corn rootworm-protected hybrid but may be planted with *Bt* corn hybrids that control corn borers. The corn rootworm refuge must represent at least 20% of the grower's corn acres (i.e. sum of MON 89034 x MON 88017 acres and corn rootworm refuge acres) and must be planted as an adjacent block, perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn rootworm refuge may be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge may also be treated with a non-*Bt* foliar insecticide for control of late season pests; however, if rootworm adults are present at the time of foliar applications then the MON 89034 x MON 88017 field must be treated in a similar manner.

b) Post-Harvest Requirements for MON 89034 x MON 88017 Sweet Corn

Sweet corn is harvested long before field corn. Therefore, if the sweet corn stalks remaining in the field and any insects remaining in the stalks are destroyed shortly after harvest, a refuge is not needed as a part of the IRM program for sweet corn. Growers must adhere to the following types of crop destruction requirements as described in the grower guide/product use guide and/or in supplements to the grower guide/product use guide, and in the case of home gardeners on the seed packet, in seed catalogues, and on websites offering MON 89034 x MON 88017 sweet corn hybrids for sale to home gardeners.

1) Crop destruction must occur no later than 30 days following harvest, but preferably within 14 days.

2) The allowed crop destruction methods are: rotary mowing, discing, or plow down or (for the home

garden use) by chopping up the stalks using home garden tools such as a hoe. Crop destruction methods should destroy any surviving resistant insects.

c) Grower Agreements for MON 89034 x MON 88017 (except for sweet corn home garden use or educational use, i.e., marketed to home gardeners or educators for use on less than 20 acres).

1) Persons purchasing MON 89034 x MON 88017 must sign a grower agreement. The term "grower agreement" refers to any grower purchase contract, license agreement, or similar legal document.

2) The grower agreement and/or specific stewardship documents referenced in the grower agreement must clearly set forth the terms of the current IRM program. By signing the grower agreement, a grower must be contractually bound to comply with the requirements of the IRM program.

3) Monsanto must continue to integrate this amended registration into the current system used for its other *Bt* corn plant-incorporated protectants, which is reasonably likely to assure that persons purchasing MON 89034 x MON 88017 corn will affirm annually that they are contractually bound to comply with the requirements of the IRM program.

4) Monsanto must continue to use its current grower agreement for MON 89034 x MON 88017 corn. If Monsanto wishes to change any part of the grower agreement or any specific stewardship documents referenced in the grower agreement that would affect either the content of the IRM program or the legal enforceability of the provisions of the agreement relating to the IRM program, thirty (30) days prior to implementing a proposed change, Monsanto must submit to EPA the text of such changes to ensure that it is consistent with the terms and conditions of this amended registration.

5) Monsanto shall maintain records of all MON 89034 x MON 88017 grower agreements for a period of three years from December 31st of the year in which the agreement was signed.

6) Monsanto make available upon request records of the number of units of MON 89034 × MON 88017 corn seed sold or shipped and not returned, and the number of such units that were sold to persons who have signed grower agreements, for the previous growing season, within three months of the request.

7) Monsanto must allow a review of the grower agreements and grower agreement records by EPA or by a State pesticide regulatory agency if the State agency can demonstrate that confidential business information, including names, personal information, and grower license number, will be protected.

d) IRM Education and IRM Compliance Monitoring Programs for MON 89034 x MON 88017

1) Monsanto must continue to implement and enhance (as set forth in paragraph 17 of this section) a comprehensive, ongoing IRM education program designed to convey to MON 89034 x MON 88017 corn users the importance of complying with the IRM program. The program shall include information encouraging MON 89034 x MON 88017 corn users to pursue optional elements of the IRM program relating to refuge configuration and proximity to MON 89034 x MON 88017 corn fields. The education program shall involve the use of multiple media (e.g., face-to-face meetings, mailing written materials, EPA-reviewed language on IRM requirements on the bag or bag tag, and electronic communications such as by Internet, radio, or television commercials). Copies of the materials will be provided to EPA for its records. The program shall involve at least one written communication annually to each MON 89034 x MON 88017 corn user separate from the grower technical guide. The communication shall inform the user of the current IRM requirements. Monsanto shall coordinate its education programs with educational efforts of other registrants and organizations, such as the National Corn Growers Association and state extension programs.

2) Annually, Monsanto shall revise, and expand as necessary, its education program to take into account the information collected through the compliance survey required under paragraphs 6a -8 of this section and from other sources. The changes shall address aspects of grower compliance that are not sufficiently high.

3) Within three months of EPA request, Monsanto shall provide copies of grower education materials and information on grower education activities including any substantive changes to these materials and activities conducted either individually or as part of a report from the industry working group, Agricultural Biotechnology Stewardship Technical Committee (ABSTC).

4) Monsanto must continue to implement and improve an ongoing IRM compliance assurance program designed to evaluate the extent to which growers purchasing MON 89034 x MON 88017 corn are complying with the IRM program and that takes such actions as are reasonably needed to assure that growers who have not complied with the program either do so in the future or lose their access to Monsanto's corn PIP products (with the exception of sweet corn home gardening or educational uses). Monsanto shall coordinate with other *Bt* corn registrants in improving its compliance assurance program and continue to integrate this amended registration into the current compliance assurance program used for its other *Bt* corn plant-incorporated protectants. Other required features of the program are described in paragraphs 5–23.

MON 89034 × MON 88017 Sweet Corn: The following IRM Education and IRM Compliance Monitoring Programs (Paragraphs 5-23) apply to all sweet corn growers who plant more than 20 acres in a single growing season:

5) Monsanto must maintain and publicize a "phased compliance approach," i.e., a guidance document that indicates how the registrant will address instances of non-compliance with the terms of the IRM program and general criteria for choosing among options for responding to any non-compliant growers after the first year of noncompliance. While recognizing that for reasons of difference in business practices there are needs for flexibility between different companies, all *Bt* corn registrants must use a consistent set of standards for responding to non-compliance. An individual grower found to be significantly out of compliance two years in a row would be denied access the next year to Monsanto's *Bt* corn products for which the grower is required to plant a separate structured refuge. Similarly, seed dealers who are not fulfilling their obligations to inform/educate growers of their IRM obligations will lose their opportunity to sell *Bt* corn.

6a) MON 89034 x MON 88017 Field Corn: The IRM compliance assurance program shall include an annual survey, conducted by an independent third party[1], of a statistically representative sample of growers of MON 89034 x MON 88017 field corn who plant the vast majority of all corn in the United States and in areas in which the selection intensity is greatest. The survey shall consider only those growers who plant 200 or more acres of corn in the Corn-Belt and who plant 100 or more acres of corn in corn-cotton areas. The survey shall measure the degree of compliance with the IRM program by growers in different regions of the country and consider the potential impact of non-response. The sample size and geographical resolution may be adjusted annually, based upon input from independent marketing research firms and academic scientists, to allow analysis of compliance behavior within regions or between regions. The sample size must provide a reasonable sensitivity for comparing results across the United States.

6b) MON 89034 x MON 88017 Sweet Corn: The IRM compliance assurance program shall include an annual survey of all MON 89034 x MON 88017 sweet corn customers who purchase 5 or more bags

[1] A third party is classified as a party other than the registrant, the grower, or anyone else with a direct interest in IRM compliance for *Bt* corn.

of MON 89034 x MON 88017 sweet corn. The survey shall measure the degree of compliance with the IRM program, identify the response rate (e.g., the percent of MON 89034 x MON 88017 sweet corn acres covered by the responses), and consider the potential impact of non-response. An independent third party will participate in the design and implementation of the survey. Data and information derived from the annual survey will be audited by an independent third party.

7) The survey shall be designed to provide an understanding of any difficulties growers encounter in implementing IRM requirements. An analysis of the survey results must include the reasons, extent, and potential biological significance of any implementation deviations.

8) The survey shall be designed to obtain grower feedback on the usefulness of specific educational tools and initiatives.

9a) MON 89034 x MON 88017 Field Corn: Monsanto shall provide a final written summary of the results of the prior year's survey (together with a description of the regions, the methodology used, and the supporting data) to EPA on or before January 31st of each year. Monsanto shall confer with other registrants and EPA on the design and content of the survey prior to its implementation.

9b) MON 89034 x MON 88017 Sweet Corn: Monsanto shall provide a written summary of the results of the prior year's survey (together with a description of the methodology used and the supporting data) to EPA on or before January 31st of each year. Monsanto shall confer with EPA on changes to the design and content of the survey prior to its implementation.

10) Annually, Monsanto shall revise, and expand as necessary, its compliance assurance program to take into account the information collected through the compliance survey required under paragraphs 6a through 8 and from other sources. The changes shall address aspects of grower compliance that are not sufficiently high. Monsanto must confer with the Agency prior to adopting any changes.

11) Monsanto shall conduct an annual on-farm assessment program. Monsanto shall train its representatives who make on-farm visits with growers of MON89034 x MON 88017 to perform assessments of compliance with IRM requirements. There is no minimum corn acreage size for this program. Therefore, growers will be selected for this program from across all farm sizes. In the event that any of these visits result in the identification of a grower who is not in compliance with the IRM program, Monsanto shall take appropriate action, consistent with its "phased compliance approach," to promote compliance.

12) Monsanto shall carry out a program for investigating legitimate "tips and complaints" that its growers are not in compliance with the IRM program. Whenever an investigation results in the identification of a grower who is not in compliance with the IRM program, Monsanto shall take appropriate action, consistent with its "phased compliance approach."

13) If a grower, who purchases MON 89034 x MON 88017 for planting, was specifically identified as not being in compliance during the previous year, Monsanto shall visit with the grower and evaluate whether the grower is in compliance with the IRM program for the current year.

14) Annually, Monsanto shall provide a report to EPA summarizing the activities carried out under their compliance assurance program for the prior year and the plans for the compliance assurance program during the current year. Within one month of submitting this report to EPA, Monsanto shall meet with EPA to discuss its findings. The report will include information regarding grower interactions (including, but not limited to, on-farm visits, verified tips and complaints, grower meetings and letters), the extent of non- compliance, corrective measures to address the non-compliance, and any follow-up actions taken. The report must inform EPA of the number of growers deemed ineligible to

purchase *Bt* corn seed on the basis of continued non-compliance with the insect resistance management refuge requirements. Monsanto may elect to coordinate information with other registrants and report collectively the results of compliance assurance programs.

15) Monsanto and the seed corn dealers for Monsanto must allow a review of the compliance records by EPA or by a State pesticide regulatory agency if the State agency can demonstrate that confidential business information, including the names, personal information, and grower license number of the growers will be protected.

16) Monsanto may coordinate with other registrants in designing and implementing its Compliance Assurance Program.

MON 89034 × MON 88017 Sweet Corn: Paragraphs 17-23 of this section shall not require any action by Monsanto until a total of 20,000 acres in any county and/or a combined U.S. total of 250,000 acres have been planted in a single year.

17) The registrant will enhance the refuge education program throughout the seed delivery channel:

i. Ensure sales representatives, licensees, seed dealers, and growers recognize the importance of correct refuge implementation and potential consequences of failure to plant the required refuge;

ii. Continue to include the refuge size requirement on all *Bt* corn seed bags or bag tags. The PIP product label accepted by EPA must include how this information will be conveyed to growers via text and graphics.

18) Monsanto will focus the majority of on-farm assessments on regions with the greatest risks for resistance:

i. Use *Bt* corn adoption, pest pressure information, and other available information to identify regions where the risk of resistance is greatest;

ii. Focus approximately two-thirds of on-farm assessments on these regions, with the remaining assessments conducted across other regions where the product is used.

19) Monsanto will use its available MON 89034 x MON 88017 sales records and other information to refine grower lists for on-farm assessments of their compliance with refuge requirements:

i. Identify for potential on-farm assessment growers whose sales information indicates they have purchased the MON 89034 x MON 88017 corn product but may have purchased little or no refuge seed from the registrant, licensee, or affiliated company.

20) The registrant will contract with third parties to perform on-farm assessments of compliance with refuge requirements:

i. The third-party assessors will conduct all first-time on-farm assessments as well as second-year on-farm assessments of those growers found out of compliance in a first-time assessment

21) The registrant will annually refine the on-farm assessment program for the *Bt* corn product to reflect the adoption rate and level of refuge compliance for the product.

22) Monsanto will follow up with growers who have been found significantly out of compliance under the on-farm assessment program and are found to be back in compliance the following year:

i. All growers found to be significantly out of compliance in a prior year will annually be sent additional refuge assistance information for a minimum of two years by Monsanto, a seed supplier, or third party assessor, after completing the assessment process;

ii. Monsanto will conduct follow-up checks on growers found to be significantly out of compliance within three years after they are found to be back in compliance;

iii. A grower found with a second incident of significant non-compliance with refuge requirements for *Bt* corn within a five-year period will be denied access the next year to Monsanto's *Bt* corn products for which the grower is required to plant a separate structured refuge.

23) Monsanto will continue to conduct and support grower education (e.g. corn clinics, certified crop advisor training, etc.) that demonstrates the economic and technology – preserving value of crop rotation as a best agronomic practice. Monsanto will submit to EPA a report with evidence of the 2012 grower education program (specifically including the number of education sessions/trainings held, locations, number of attendees, examples of presentation materials and grower survey results if available) by July 31st 2013. For the following seasons, Monsanto will submit a similar report upon the request of the agency within three months of the request.

e) Insect Resistance Monitoring and Remedial Action Plans for MON 89034 x MON 88017

1) The Agency is imposing the following conditions for the Cry1A.105 and Cry2Ab2 toxins expressed in MON 89034:

i. Monsanto must monitor for resistance to Cry1A.105 and Cry2Ab2 expressed in MON 89034.

ii. The resistance monitoring program must include the following two approaches: (1) focused population sampling and laboratory testing and (2) investigation of reports of less-than expected control of labeled insects. Should field relevant resistance be confirmed, an appropriate resistance management action plan will be implemented.

(a) Focused Population Sampling

Monsanto must develop and ensure the implementation of a plan for resistance monitoring for *Spodoptera frugiperda* (fall armyworm or FAW) in counties in which MON 89034 and/or MON 89034 x MON 88017 sweet corn acreage exceeds 5,000 acres and the pest is capable of overwintering in that county. Monsanto should consult with academic and United States Department of Agriculture (USDA) experts in developing the monitoring plan and will provide EPA with a copy of its proposed resistance monitoring plan for EPA's approval prior to implementation. This proposed FAW monitoring plan must be submitted to EPA by January 31st of the year following that in which MON 89034 and/or MON 89034 x MON 88017 sweet corn acreage exceeds the trigger specified in this requirement (i.e., greater than 5,000 acres in any county in which FAW overwinters). The proposed plan must be implemented the season following the acreage trigger being met. The proposed plan will remain in place until an EPA approved plan can be implemented.

Annually, Monsanto shall sample and bioassay populations of the key target pests: *Ostrinia nubilalis* (European corn borer; ECB), *Diatraea grandiosella* (Southwestern corn borer; SWCB), and *Helicoverpa zea* (corn earworm; CEW). Sampling for the target pests will be focused in areas identified as those with the highest risk of resistance development (e.g., where lepidopteran-active *Bt* hybrids are planted on a high proportion of the corn acres, and where the insect species are regarded as key pests of corn). Bioassay methods must be

appropriate for the goal of detecting field-relevant shifts in population response to MON 89034 x MON 88017 and/or changes in resistance-allele frequency in response to the use of MON 89034 x MON 88017 and, as far as possible, should be consistent across sampling years to enable comparisons with historical data. Each protein in MON 89034 must be tested separately, rather than a mixture of the two proteins, because resistance to one protein could be masked by the activity of the other.

The number of populations to be collected shall reflect the regional importance of the insect species as a pest, and specific collection regions will be identified for each pest. For ECB, a minimum of 12 populations across the sampling region will be targeted for collection at each annual sampling. For SWCB, the target will be a minimum of six populations. For CEW, the target will be a minimum of 10 populations. Pest populations should be collected from multiple corn-growing states reflective of different geographies and agronomic conditions. To obtain sufficient sensitivity to detect resistance alleles before they become common enough to cause measurable field damage, each population collection shall attempt to target 400 insect genomes (egg masses, larvae, mated females, and/or mixed-sex adults), but a successful population collection will contain a minimum of 100 genomes. It is recognized that it may not be possible to collect the target number of insect populations or genomes due to factors such as natural fluctuations in pest density, environmental conditions, and area-wide pest suppression.

The sampling program and geographic range of collections may be modified as appropriate based on changes in pest importance and for the adoption levels of MON 89034 x MON 88017. The Agency shall be consulted prior to the implementation of such modifications.

Monsanto will report to the Agency, by August 31st of each year, the results of the population sampling and bioassay monitoring program.

Any incidence of unusually low sensitivity to the Cry1A.105 and Cry2Ab2 proteins in bioassay shall be investigated as soon as possible to understand any field relevance of such a finding. Such investigations shall proceed in a stepwise manner until the field relevance can be either confirmed or refuted, and results of these shall be reported to the Agency annually before August 31st. The investigative steps will include:

1. Re-test progeny of the collected population to determine whether the unusual bioassay response is reproducible and heritable. If it is not reproducible and heritable, no further action is required.

2. If the unusual response is reproducible and heritable, progeny of insects that survive the diagnostic concentration will be tested using methods that are representative of exposure to MON 89034 x MON 88017 under field conditions. If progeny do not survive to adulthood, any suspected resistance is not field relevant and no further action is required.

3. If insects survive steps 1 and 2, resistance is confirmed; and further steps will be taken to taken to evaluate the resistance. These steps may include:

- Determining the nature of the resistance (i.e., recessive or dominant, and the level of functional dominance);

- Estimating the resistance-allele frequency in the original population;

- Determining whether the resistance-allele frequency is increasing by analyzing field collections in subsequent years sampled from the same site where the resistance allele(s) was originally collected;

- Determining the geographic distribution of the resistance allele by analyzing field collections in subsequent years from sites surrounding the site where the resistance allele(s) was originally collected.

Should field relevant resistance be confirmed, and the resistance appears to be increasing or spreading, Monsanto will consult with the Agency to develop and implement a case-specific resistance management action plan.

(b) Investigation of Reports of Unexpected Levels of Damage by Lepidopteran Target Pests

Monsanto will follow up on grower, extension specialist or consultant reports of unexpected levels of damage by the lepidopteran pests listed on the pesticide label. Monsanto will instruct its customers to contact them if such incidents occur. Monsanto will investigate all legitimate reports submitted to the company or the company's representatives.

If reports of unexpected levels of damage lead to the suspicion of resistance in any of the key target pests (ECB, SWCB, CEW, and FAW), Monsanto will implement the actions described below, based on the following definitions of *suspected resistance* and *confirmed resistance.*

Suspected resistance

EPA defines *suspected resistance* to mean field reports of unexpected levels of insect feeding damage for which:

- The corn in question has been confirmed to be lepidopteran-active Bt corn;
- The seed used had the proper percentage of corn expressing Bt protein;
- The relevant plant tissues are expressing the expected level of Bt protein; and
- It has been ruled out that species not susceptible to the protein could be responsible for the damage, that no climatic or cultural reasons could be responsible for the damage, and that there could be no other reasonable causes for the damage.

EPA does not interpret *suspected resistance* to mean grower reports of possible control failures or suspicious results from annual insect monitoring assays, nor does the Agency intend that extensive field studies and testing be undertaken to confirm scientifically the presence of insects resistant to MON 89034 x MON 88017 in commercial production fields before responsive measures are undertaken.

If resistance is *suspected,* Monsanto will instruct growers to do the following:

- Use alternative control measures in MON 89034 x MON 88017 fields in the affected region to control the target pest during the immediate growing season.
- Destroy MON 89034 x MON 88017 crop residues in the affected region within one month after harvest with a technique appropriate for local production practices to minimize the possibility of resistant insects over-wintering and contributing to the next season's target pest population.

Additionally, if possible, and prior to the application of alternative control measures or destruction of crop residue, Monsanto will collect samples of the insect population in the affected fields for laboratory rearing and testing. Such rearing and testing shall be conducted as expeditiously as practical.

Confirmed resistance

EPA defines *confirmed resistance* to mean, in the case of field reports of unexpected levels of damage from the key target pests, that all the following criteria are met:

- There is >30% insect survival and commensurate insect feeding in a bioassay, initiated with neonate larvae, that uses methods that are representative of exposure to *Bt* corn hybrids under field conditions (ECB and SWCB only) .

- In standardized laboratory bioassays using diagnostic concentrations of the *Bt* protein suited to the target pest in question, the pest exhibits resistance that has a genetic basis and the level of survivorship indicates that there may be a resistance-allele frequency of ≥ 0.1 in the sampled population.

- In standardized laboratory bioassays, the LC_{50} exceeds the upper limit of the 95% confidence interval of the LC_{50} for susceptible populations surveyed both in the original baselines developed for this pest species and in previous years of field monitoring.

(c) Response to Confirmed Resistance in a Lepidopteran Target Pest as the Cause of Unexpected Levels of Damage in the Field

When field resistance is *confirmed* (as defined above), the following steps will be taken by Monsanto:

- EPA will receive notification within 30 days of resistance confirmation;

- Affected customers and extension agents will be notified about confirmed resistance within 30 days;

- Monitoring will be increased in the affected area and local target pest populations will be sampled annually to determine the extent and impact of resistance;

- If appropriate (depending on the resistant pest species, the extent of resistance, the timing of resistance, and the nature of resistance, and the availability of suitable alternative control measures), alternative control measures will be employed to reduce or control target pest populations in the affected area. Alternative control measures may include advising customers and extension agents in the affected area to incorporate crop residues into the soil following harvest to minimize the possibility of over-wintering insects, and/or applications of chemical insecticides;

- Unless otherwise agreed with EPA, stop sale and distribution of the relevant lepidopteran-active *Bt* corn hybrids in the affected area immediately until an effective local mitigation plan approved by EPA has been implemented;

- Monsanto will develop a case-specific resistance management action plan within 90 days according to the characteristics of the resistance event and local agronomic needs. Monsanto will consult with appropriate stakeholders in the development of the action plan, and the details of such a plan shall be approved by EPA prior to implementation;

- Notify affected parties (e.g., growers, consultants, extension agents, seed distributors, university cooperators and state/federal authorities as appropriate) in the region of the resistance situation and approved action plan; and

- In subsequent growing seasons, maintain sales suspension and alternative resistance management strategies in the affected region(s) for the *Bt* corn hybrids that are affected by the resistant population until an EPA-approved local resistance management plan is in place to mitigate the resistance.

A report on results of resistance monitoring and investigations of damage reports must be submitted to the Agency annually by August 31st each year, for the duration of the conditional registration.

2) The Agency is imposing the following conditions for the Cry3Bb1 toxin expressed in MON 88017:

i. Monsanto must monitor for Cry3Bb1 resistance and/or trends in increased tolerance for corn rootworm utilizing the current corn rootworm resistance monitoring plan for MON 89034 x MON 88017. Sampling should be focused in those areas in which there is the highest risk of resistance development.

ii. The resistance monitoring plan must include the following: baseline sensitivity data, sampling (number of locations, samples per locations), sampling methodology and life stage sampled, bioassay methodology, standardization procedures (including quality assurance/quality control provisions), detection technique and sensitivity, statistical analysis of the probability of detecting resistance, and a revised description of rootworm damage guidelines.

iii. Monsanto must develop and utilize a functional "on-plant" diagnostic assay[2] for corn rootworm resistance monitoring to detect potentially resistant individuals and incorporate this assay into the annual resistance monitoring program.

iv. Monsanto must work to develop a proactive resistance monitoring program for northern corn rootworm (*Diabrotica barberi*). This program should include a proposal for annual sampling and testing of northern corn rootworm susceptibility to Cry3Bb1. As part of the effort, Monsanto may need to investigate novel techniques for rearing and conducting bioassays with northern corn rootworm. A report on Monsanto's progress towards this requirement must be included in the annual resistance monitoring report to EPA.

v. Monsanto must follow-up on grower, extension specialist, or consultant reports of unexpected damage or control failures for corn rootworm (as described in section *(a)* below).

vi. Monsanto must provide EPA with a resistance monitoring report on or before August 31st of each year, reporting on populations collected the previous year.

(a) Investigation of Reports of Unexpected Levels of Damage by Corn Rootworm (CRW): Performance Inquiries

a) Investigation. Monsanto is required to investigate "performance inquiries" (i.e., reports of unexpected corn rootworm damage to MON 89034 x MON 88017 corn) from growers. Fields with unexpected damage that meet both of the criteria below must be subjected to the follow-up actions described in section b) below:

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[2] Examples of on-plant bioassays include:
Nowatzki T, Lefko SA, Binning RR, Thompson SD, Spencer TA, Siegfried BD. 2008. Validation of a novel resistance monitoring technique for corn rootworm (Coleoptera: Chrysomelidae) and event DAS-59122-7 maize. *J. Appl. Entomol.* 132:177–188 and
Gassmann A.J., J.L. Petzold-Maxwell, R.S. Keweshan, and M.W. Dunbar, 2011. Field-evolved resistance to *Bt* maize by western corn rootworm. *PLOS one*, Vol. 6 (7): 1-7.

1. The affected plants are confirmed to be MON 89034 x MON 88017 plants; **and**

2. Corn rootworm feeding caused root damage with a Node Injury Score (NIS) > 1.0 on at least 50% of plants sampled.

b) Follow-up actions (performance inquiries). For MON 89034 x MON 88017 fields meeting the criteria in part a) above, Monsanto must take the following actions:

- Take leaf samples to determine the presence of the *Bt* protein.
- Collect at least 250 (ideally 500 or more) CRW adult individuals from field in question. Collections may be extended to any bordering corn fields, if necessary to obtain sufficient CRW adult individuals. Collected populations must be subjected to the steps described for "investigation of populations of concern" (section ***(b)*** below).
- Visit affected farm or field the following year (assuming repurchase) and attempt to collect corn rootworm adults, if collections are unsuccessful.
- Review with the grower their CRW management practices and provide CRW management recommendations. Options include, but are not limited to the following:
    - Rotation to non-host crop
    - Use of pyramided products
    - Use of additional corn rootworm control tools (e.g., soil insecticides, seed-applied insecticides, chemigation)
    - Use of an alternative corn rootworm-active plant incorporated protectant
- Include information on unexpected damage reports in its annual CRW monitoring submission to EPA.

(b) Investigation of Populations of Concern:

Monsanto must conduct investigations of all CRW populations collected as part of the performance inquiry process in section ***(a)*** above. A CRW population will be considered resistant to Cry3Bb1 if the following criteria are met and additional collections and testing are not deemed to be necessary (see below):

1. An initial performance inquiry investigation results in a finding of Unexpected Damage; **and**

2. Where green tissues are available and plants are unusually stressed, *Bt* protein levels in affected plants are found to be within the documented range for that hybrid (if data are available); **and**

3. Single, on-plant bioassays of insect collections from the affected fields show the following:

- A statistically significant difference in measures of either lethality/mortality or sublethal effects (growth/development) between the field population and the control population on *Bt* corn **and**
- A lack of a statistically significant difference in the same measures of the field population raised on *Bt* corn and non-*Bt* corn plants.

Mitigation, as detailed in section *(c)* below, is required for any CRW population/ MON 89034 x MON 88017 field that meets the above resistance criteria, unless the circumstances described below are applicable.

To minimize the potential for incorrectly reaching a conclusion of resistance, another year of CRW adult collections and additional testing would be needed to determine resistance if:

- The results of the single, on-plant bioassays are inconclusive (e.g., the results of the statistical analysis are unclear because of low sample sizes) or

- Another reasonable explanation for the unexpected damage exists (e.g., high pest pressure and/or high plant stress).

In these cases, Monsanto and EPA will discuss and align on next steps before any resistance conclusion is reached.

If CRW collections are not possible in the current year or subsequent years due to successful management practices, then no further investigation is needed. The population would be considered "mitigated" meaning, in this case, that the population is suppressed or extirpated in this location. However, EPA recommends that Monsanto continue to be vigilant in areas where CRW populations were successfully mitigated.

(c) Mitigation of Resistant CRW Populations

For any CRW population found to be resistant under the criteria described in section ***(b)*** above, Monsanto must take the following steps:

- Monsanto must inform EPA of the results of the on-plant bioassays as soon as possible, but at least within 30 days if measures appear to be triggered.

- Resistance may affect a single field, multiple fields in a localized area, or affect fields across larger areas. The geographic extent of resistance will be determined based upon product performance in surrounding areas, using information available from follow-up investigations of other performance inquiries in the area. Additional rootworm population collections and bioassays may be conducted to establish the geographic scope of confirmed resistance. These investigations will determine the Remedial Action Zone. Because this enhanced resistance monitoring program is designed to be highly responsive to changes in product performance and to implement protective measures even in the absence of confirmed resistance, it is expected that resistant populations will be limited in geographic scope and size at the time of confirmation.

- In situations where Resistance is confirmed, the product is expected to no longer reliably provide economic levels of control of corn rootworm populations. Upon confirmation of resistance, stakeholders in the Remedial Action Zone, including customers, extension agents and crop consultants and other registrants, as appropriate, will be informed so that best management practices can be followed. Management of resistant populations in the Remedial Action Zone will involve the integration of multiple pest management practices (i.e. "IPM") that are already used in the absence of the product, such as:

    - crop rotation,

    - pyramided products,

- pest population monitoring,
- soil-applied and seed-applied insecticides,
- insecticides to control corn rootworm adults, and
- alternative corn rootworm-active traits.

- The goal of the resistant corn rootworm management program will be to manage the rootworm population economically while reducing the probability or rate that the resistant population spreads to surrounding areas. Depending on the characteristics of the resistant population, the product may or may not fit within the management program. For example, if the level of rootworm survival on the product conferred by resistance is low (e.g., if resistant insects still show reduced fitness on the product), then continued use of the product in combination with other pest management tools may be an effective approach for reducing the local population. On the other hand, if the level of corn rootworm survival on the product that is conferred by resistance is high, the product would not be expected to contribute significantly to population reduction and ceasing its use in the Remedial Action Zone may allow the population to return to susceptibility.

- Research will be conducted to understand the resistance, with the intention of using information generated to refine the management program. Such research may include characterizing the genetics of resistance (e.g., number of genes, functional dominance, mechanism of resistance, and cross-resistance) and the biology of resistant insects (e.g., fitness in the presence and absence of the product, and other control tactics).

- The corn rootworm population in the Remedial Action Zone will continue to be monitored annually for reversion to susceptibility. This monitoring may include continued investigation into product performance as well as sampling and bioassays of the local corn rootworm population. If population susceptibility returns to baseline levels, the remedial actions can be lifted and growers can resume the use of the product as a primary tool for corn rootworm management.

f) Annual Reporting Requirements for Mon 89034 x MON 88017

1) Compliance Assurance Plan: Compliance Assurance Program activities, including IRM Grower Survey and on-farm assessment results as required by this registration, for the previous year and plans for the compliance assurance program during the current year, on or before January 31st of each year.

2) Insect Resistance Monitoring Results: Results of monitoring and investigations of damage reports as required by this registration, on or before August 31st each year.

If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). Your release for shipment of this product constitutes acceptance of these conditions.

The basic confidential statement of formula (CSF) dated 6/19/13 is acceptable and supersedes all previous basic CSFs. A copy has been placed in the file jacket for this registration.

A stamped copy of the label is enclosed for your records.

Sincerely,

Kimberly Nesci, Chief
Microbial Pesticides Branch
Biopesticides and Pollution
Prevention Division (7511P)

Enclosure

Plant-Incorporated Protectant Label

MON 89034 × MON 88017

Lepidopteran-and Rootworm-Protected Corn

(Alternate Brand Names:
MON 89034 × MON 88017 field corn – Genuity® VT Triple Pro®
MON 89034 × MON 88017 sweet corn – Performance Series™)
(OECD Unique Identifier: MON-89Ø34-3 × MON 88Ø17-3)

Active Ingredients:

Bacillus thuringiensis Cry1A.105 protein and the genetic material necessary for its production (vector PV-ZMIR245) in MON 89034 × MON 88017 corn (OECD Unique Identifier: MON-89Ø34-3 × MON-88Ø17-3) 0.0024%*

Bacillus thuringiensis Cry2Ab2 protein and the genetic material necessary for its production (vector PV-ZMIR245) in MON 89034 × MON 88017 corn (OECD Unique Identifier: MON-89Ø34-3 × MON-88Ø17-3) 0.0057%*

Bacillus thuringiensis Cry3Bb1 protein and the genetic material necessary for its production (vector PV-ZMIR39) in MON 89034 × MON 88017 corn (OECD Unique Identifier: MON-89Ø34-3 × MON-88Ø17-3) 0.0070%*

Other Ingredient:

CP4 EPSPS protein (5-enolpyruvylshikimate-3-phosphate synthase) and genetic material necessary for its production (vector PV-ZMIR39) in MON 89034 × MON 88017 corn (OECD Unique Identifier: MON-89Ø34-3 × MON-88Ø17-3) 0.0069%*

*Percentage (wt/wt) on a dry weight basis whole plant (forage)

KEEP OUT OF REACH OF CHILDREN

Caution

NET CONTENTS_____

EPA Registration No. 524-576

EPA Establishment No. 524-MO-002

ACCEPTED
JUL - 2 2013
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 524-576

Monsanto Company
800 North Lindbergh Blvd.
St Louis, MO 63167

®Genuity and VT Triple Pro are registered trademarks of Monsanto Technology, LLC.
™Performance Series is a trademark of Monsanto Technology, LLC.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with this labeling. Information regarding commercial production must be included in the Technology Use Guide and/or IRM Grower Guide.

The subject registration will automatically expire on midnight September 30, 2015.

MON 89034 × MON 88017 protects corn crops from leaf, stalk, and ear damage caused by corn borers and root damage caused by corn rootworm larvae.

This plant-incorporated protectant (PIP) may be combined through conventional breeding with other registered plant-incorporated protectants that are similarly approved for use in combination, through conventional breeding, with other registered plant-incorporated protectants to produce inbred corn lines and hybrid corn varieties with combined pesticidal traits.

1) Refuge Requirements for MON 89034 × MON 88017 Field Corn

In order to minimize the risk of corn borers and corn rootworms developing resistance to MON 89034 × MON 88017 corn, an insect resistance management plan must be implemented which includes planting of a structured refuge.

These refuge requirements do not apply to seed increase/propagation of inbred and hybrid seed corn up to a total of 20,000 acres per county and up to a combined United States (U.S.) total of 250,000 acres per plant-incorporated protectant (PIP) active ingredient per registrant per year. Furthermore, these refuge requirements do not apply to commercial hybrid sweet corn.

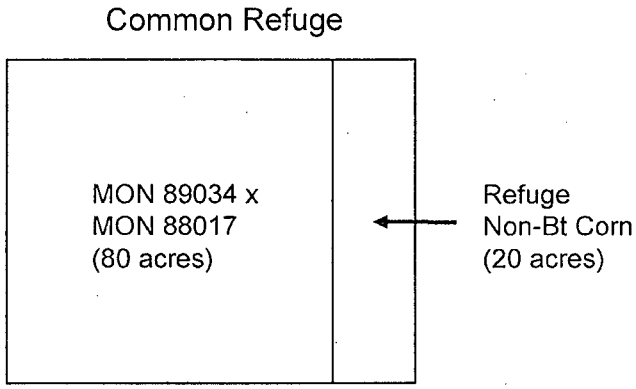
The refuge and MON 89034 × MON 88017 corn should be sown on the same day, or with the shortest window possible between planting dates to ensure that corn root development is similar among varieties. If the refuge is planted on rotated ground, then the MON 89034 × MON 88017 corn must also be planted on rotated ground. If the combined refuge is planted on continuous corn, then MON 89034 × MON 88017 may be planted on either continuous or rotated land (option encouraged where WCRW rotation resistant biotype may be present). Refuge options are based on the planting of MON 89034 × MON 88017 in cotton or non-cotton growing regions and the insect pressure present in those locations. If insecticides are applied to the refuge for control of CRW adults, the same treatment must also be applied in the same timeframe to MON 89034 × MON 88017.

a) Corn-Belt/Non-Cotton Growing Area Refuge Requirements

For MON 89034 × MON 88017 field corn grown outside cotton-growing areas (e.g., the Corn Belt), two options for deployment of the refuge are available to growers.

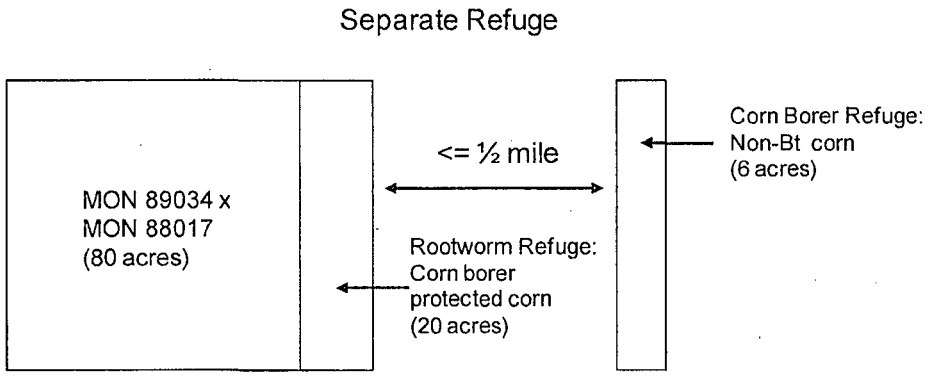
The first option is planting a **common refuge** for both corn borers and corn rootworms. The common refuge must be planted with corn hybrids that do not contain Bt technologies for the control of corn borers or corn rootworms. The refuge area must represent at least 20% of the grower's corn acres (i.e., sum of MON 89034 × MON 88017 acres and refuge acres; refuge area must contain 20 acres of corn for every 80 acres of MON 89034 × MON 88017 corn planted). It must be planted as block within or adjacent (e.g., across the road) to the MON 89034 × MON 88017 field, perimeter strips (i.e., strips around the field), or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The common

refuge can be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge can also be treated with a non-Bt foliar insecticide for the control of late season pests if pest pressure reaches an economic threshold for damage; however, if rootworm adults are present at the time of foliar applications then the MON 89034 × MON 88017 field (acres) must be treated in a similar manner. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants, etc.). A schematic illustration of one common refuge deployment option is shown below:



The second option is planting **separate refuge** areas (e.g., two refuge areas, a double refuge, or paired refuge areas) for corn borers and corn rootworms. Refuge planting options include: separate fields, blocks within fields (e.g., along the edges or headlands), perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn borer refuge must be planted with corn that is not a lepidopteran-protected Bt hybrid, must represent at least 5% of the grower's corn acres, and must be planted within ½ mile of the MON 89034 × MON 88017 field. The corn borer refuge can be treated with a soil-applied or seed-applied insecticide for corn rootworm larval control, or a non-Bt foliar applied insecticide for corn borer control if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants, etc.).

The corn rootworm refuge must be planted with corn that is not a corn rootworm-protected Bt hybrid, but can be planted with Bt hybrids that control corn borers. The corn rootworm refuge must represent at least 20% of the grower's corn acres (i.e., corn rootworm refuge must contain 20 acres of corn for every 80 acres of MON 89034 × MON 88017 corn planted) and must be planted as a block within or adjacent to the MON 89034 × MON 88017 field, strips around the field, perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn rootworm refuge can be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge can also be treated with a non-Bt foliar insecticide for control of late season pests; however, if corn rootworm adults are present at the time of foliar applications then the MON 89034 × MON 88017 field must be treated in a similar manner. A schematic illustration of one separate refuge option with the corn rootworm refuge planted as a block within the field and the corn borer refuge planted within a ½ mile of the MON 89034 × MON 88017 field is shown below:

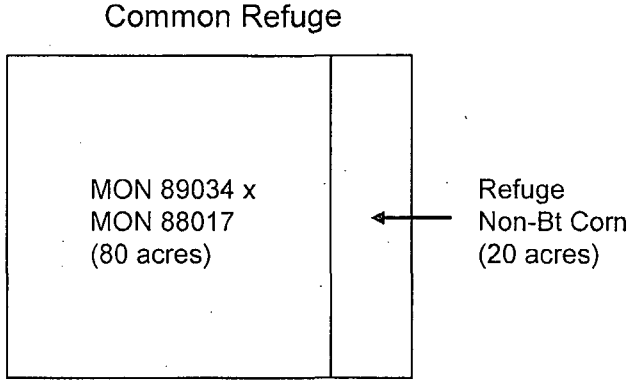


b) Cotton-Growing Area Refuge Requirements

Cotton-growing areas include the following states: Alabama, Arkansas, Georgia, Florida, Louisiana, North Carolina, Mississippi, South Carolina, Oklahoma (only the counties of Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman, Washita), Tennessee (only the counties of Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, ' Obion, Rutherford, Shelby, and Tipton), Texas (except the counties of Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts, and Sherman), Virginia (only the counties of Dinwiddie, Franklin City, Greensville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey, Sussex) and Missouri (only the counties of Dunklin, New Madrid, Pemiscot, Scott, Stoddard).

For MON 89034 × MON 88017 field corn grown in cotton growing areas of the U.S. the common refuge and separate refuge options (e.g., two-refuge options, double-refuge options, paired-refuge options) are available as specified below.

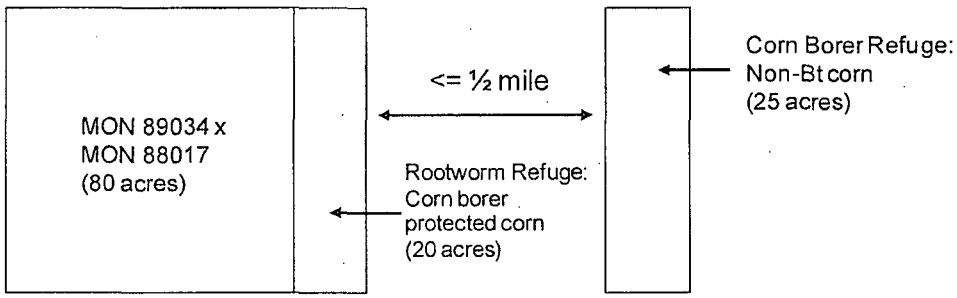
The first option is planting a **common refuge** for both corn borers and corn rootworms. The common refuge must be planted with corn hybrids that do not contain Bt technologies for the control of corn borers or corn rootworms. The refuge area must represent at least 20% of the grower's corn acres (i.e., sum of MON 89034 × MON 88017 acres and refuge acres; refuge area must contain 20 acres of corn for every 80 acres of MON 89034 × MON 88017 corn planted). It must be planted as block within or adjacent (e.g., across the road) to the MON 89034 × MON 88017 field, perimeter strips (i.e., strips around the field), or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The common refuge can be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge can also be treated with a non-Bt foliar insecticide for the control of late season pests if pest pressure reaches an economic threshold for damage; however, if rootworm adults are present at the time of foliar applications then the MON 89034 × MON 88017 field (acres) must be treated in a similar manner. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants, etc.). A schematic illustration of one common refuge deployment option is shown below:



The second option is planting **separate refuge** areas (e.g., two refuge areas, a double refuge, or paired refuge areas) for corn borers and corn rootworms. Refuge planting options include: separate fields, blocks within fields (e.g., along the edges or headlands), perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn borer refuge must be planted with corn that is not a lepidopteran-protected Bt hybrid, must represent at least 20% of the grower's corn acres, and must be planted within ½ mile of the MON 89034 × MON 88017 field. The corn borer refuge can be treated with a soil-applied or seed-applied insecticide for corn rootworm larval control, or a non-Bt foliar applied insecticide for corn borer control if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants, etc.).

The corn rootworm refuge must be planted with corn that is not a corn rootworm-protected Bt hybrid, but can be planted with Bt hybrids that control corn borers. The corn rootworm refuge must represent at least 20% of the grower's corn acres (i.e., corn rootworm refuge must contain 20 acres of corn for every 80 acres of MON 89034 × MON 88017 corn planted) and must be planted as a block within or adjacent to the MON 89034 × MON 88017 field, perimeter strips, or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 consecutive rows wide. The corn rootworm refuge can be treated with a soil-applied or seed-applied insecticide to control rootworm larvae and other soil pests. The refuge can also be treated with a non-Bt foliar insecticide for control of late season pests; however, if corn rootworm adults are present at the time of foliar applications then the MON 89034 × MON 88017 field must be treated in a similar manner. A schematic illustration of one separate refuge option with the corn rootworm refuge planted as a block within the field and the corn borer refuge planted within a ½ mile of the MON 89034 × MON 88017 field is shown below:

Separate Refuge



2) Post-Harvest Requirements for MON 89034 × MON 88017 Sweet Corn

For MON 89034 × MON 88017 sweet corn, growers are required to destroy any MON 89034 × MON 88017 sweet corn stalks that remain in the field following harvest via rotary mowing, discing, or plow-down or (for home garden use) by chopping up the stalks using home garden tools such as a hoe within one (1) month of harvest, but preferably within 14 days.

Corn Insects Controlled

European corn borer	*Ostrinia nubilalis*
Southwestern corn borer	*Diatraea grandiosella*
Southern cornstalk borer	*Diatraea crambidoides*
Corn earworm	*Helicoverpa zea*
Fall armyworm	*Spodoptera frugiperda*
Stalk borer	*Papaipema nebris*
Lesser corn stalk borer	*Elasmopappus lignosellus*
Sugarcane borer	*Diatraea saccharalis*
Western corn rootworm	*Diabrotica virgifera virgifera*
Northern corn rootworm	*Diabrotica barberi*
Mexican corn rootworm	*Diabrotica virgifera zeae*

Sales of corn hybrids that contain Monsanto's Bt corn plant incorporated protectants must be accompanied by a Grower Guide which includes information on planting, production and insect resistance management and notes that routine applications of insecticides to control these insects are usually unnecessary when corn containing the Bt proteins is planted.

MON 89034 × MON 88017 is a product of Monsanto's research program offering unique genetic characteristics for specific grower needs and may be protected by one or more of the following U.S. patents: 5554798, 5641876, 5717084, 5728925, 6025545, 6051753, 6063597, 6083878, 6489542, 6645497, 6713063, 6962705, 7064249, 7070982, 7250501, 7304206, 7544862, 7618942, 7700830, 7927598, and RE39247.