Active Ingredients:

*Bacillus thuringiensis* Cry1F protein and the genetic material (plasmid insert PHI8999A) necessary for its production in corn event DAS-Ø15Ø7-1 ...................................................... <0.0011%

*Bacillus thuringiensis* Cry34Ab1 protein and the genetic material (PHP17662 T-DNA) necessary for its production in corn event DAS-59122-7 ........................................................ <0.0054%

*Bacillus thuringiensis* Cry35Ab1 protein and the genetic material (PHP17662 T-DNA) necessary for its production in corn event DAS-59122-7 ...................................................... <0.0042%

*Bacillus thuringiensis* Cry1Ab protein and the genetic material (vector PV-ZMBK07) necessary for its production in corn event MON-ØØ81Ø-6 ..................................................... <0.0015%

Other Ingredient:

Phosphinothricin acetyltransferase (PAT) protein and the genetic material (plasmid insert PHI8999A and PHP17662 T-DNA) necessary for its production in corn events DAS-Ø15Ø7-1 and DAS-59122-7 ........................................................ ...................... <0.0013%

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

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

NET CONTENTS ________________

EPA REGISTRATION NUMBER: 29964-8

EPA ESTABLISHMENT NUMBER: 029964-IA-001

Pioneer Hi-Bred International, Inc.
7300 NW 62nd Avenue
Johnston, IA 50131
DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

The plant-incorporated protectant must be used as specified in the terms and conditions of the registration.

Optimum® Intrasect® Xtra combines the insect protection features of Herculex®1 XTRA (EPA Reg. No.: 29964-5) and Yieldgard2 Corn Borer (EPA Reg. No.: 524-489) in the same corn hybrid or inbred. Optimum Intrasect Xtra hybrids protect corn crops from leaf, stalk and ear damage caused by lepidopteran corn pests such as the European corn borer and root damage caused by corn rootworm larvae. In order to minimize the risk of the corn pests developing resistance to Optimum Intrasect Xtra, an insect resistance management plan must be implemented.

INSECT RESISTANCE MANAGEMENT

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 active ingredient per registrant per year.

Corn seed bags or bag tags for products containing Optimum Intrasect Xtra must include the refuge size requirement in text and graphical format.

Growers are instructed to read information on insect resistance management. The following information regarding refuge placement for commercial production must be included in the Grower Guide:

The use of Optimum Intrasect Xtra requires accompanying refuge corn for the Cry1F, Cry1Ab and Cry34/35Ab1 components that meets the requirements of the individual traits, described below. The refuge(s) for these traits may be combined by planting non-\textit{Bacillus thuringiensis} (\textit{Bt}) corn as the refuge (see C. below), or the refuge for each trait may be planted separately (see A. and B. below).

For the separate refuges, corn rootworm-resistant \textit{Bt} corn (e.g., Herculex® RW; EPA Reg. No.: 29964-4) may be planted in the lepidopteran refuge for the Cry1F and Cry1Ab components and lepidopteran-resistant \textit{Bt} corn (e.g., Herculex® I; EPA Reg. No.: 29964-3) may be planted in the corn rootworm refuge for the Cry34/35Ab1 component. Depending on cropping practices, pest problems, and pest management options employed on any given farm, growers may need to choose different refuge arrangements for different fields. Possible options include: two refuge blocks (one for rootworm, one for \textit{Lepidoptera}) can be planted within one field, or strips can be used for either refuge. Alternatively, a block of Herculex® RW (EPA Reg. No.: 29964-4) can serve as an in-field lepidopteran refuge for one field planted to Optimum Intrasect Xtra and an external lepidopteran refuge for separate fields planted to Optimum Intrasect Xtra, while the rootworm refuge is planted as lepidopteran-resistant \textit{Bt} corn (e.g., Herculex® I; EPA Reg. No.: 29964-3) in an external adjacent field. In all options, size and management of each individual refuge must be followed as described in A. and B below.

Other refuge designs and combinations are permissible as long as in all cases the size and management of each refuge are described in A., B., and C. below.

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1 Herculex® Insect Protection technology by Dow AgroSciences and Pioneer Hi-Bred. Herculex is a registered trademark of Dow AgroSciences LLC.

2 Yieldgard is a registered trademark used under the license from Monsanto Company.
A. Lepidopteran refuge for the Cry1F and Cry1Ab components.

1. **Refuge size.** In all Corn-growing Areas the use of Optimum Intrasect Xtra requires an accompanying 20% refuge consisting of non-\textit{Bt} corn or corn that is not a lepidopteran-protected \textit{Bt} hybrid.

2. **Refuge location.**
   - The lepidopteran refuge can be planted in a separate field within a $\frac{1}{2}$ mile of the Optimum Intrasect Xtra field.
   - The lepidopteran refuge can be planted within the Optimum Intrasect Xtra field as blocks (e.g. along the edges or headlands).
   - The lepidopteran refuge can be planted within the Optimum Intrasect Xtra field as strips across the field at least four (4) consecutive crop rows wide.

3. **Refuge management.**
   - Insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, sugarcane borer, stalk borer and southern corn stalk borer may be applied only if economic thresholds are reached for one or more of these target pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g. Extension Service Agents, crop consultants). Microbial \textit{Bt} insecticides must not be applied to refuges consisting of non-\textit{Bt} corn or corn that is not a lepidopteran-protected \textit{Bt} hybrid.

B. Corn rootworm refuge for the Cry34/35Ab1 component.

1. **Refuge size.** The use of Optimum Intrasect Xtra requires an accompanying 20% refuge consisting of non-\textit{Bt} corn or non-corn rootworm-resistant \textit{Bt} corn.

2. **Refuge location.** The rootworm refuge is required to be planted within or adjacent (e.g. across the road) to the Optimum Intrasect Xtra field.

3. **Refuge management options.** The rootworm refuge can be managed in such a way that there is little or no yield loss to rootworms, but must be managed in a way that it is sufficiently productive of susceptible rootworm adults.
   - The in-field rootworm refuge options may be planted as a single block or as a series of strips measuring at least four (4) consecutive crop rows wide.
   - Seed mixtures of Optimum Intrasect Xtra and rootworm refuge corn are not permitted.
   - If the rootworm refuge is planted on rotated ground, then Optimum Intrasect Xtra must also be planted on rotated ground.
   - If the rootworm refuge is planted in continuous corn, the Optimum Intrasect Xtra field may be planted on either continuous or rotated land (option encouraged where WCRW rotation-resistant biotype may be present).
   - Application of soil insecticide is permitted in the rootworm refuge.
   - Seed treatment is permitted in the rootworm refuge, either at a rate for rootworm protection or at a rate for controlling secondary soil pests.
   - If aerial insecticides are applied to the rootworm refuge for control of CRW adults, the same treatment must also be applied in the same time-frame to Optimum Intrasect Xtra.
   - Pests other than adult corn rootworms can be treated on the rootworm refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. Pests on the Optimum Intrasect Xtra acres can be treated as needed without having to treat the rootworm refuge.
   - The rootworm refuge can be planted to any corn hybrid that does not express PIPs for rootworm control (e.g. lepidopteran-protected \textit{Bt} corn, herbicide-tolerant corn, or conventional corn).
• The rootworm refuge and Optimum Intrasect Xtra 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.
• Growers are encouraged to plant the rootworm refuge in the same location each year, as it allows the rootworm population to remain high and the durability of the trait is extended. This option may be preferable to growers who wish to only think of their refuge design once and for growers who grow continuous corn. However, for those growers who need to employ crop rotation, a fixed refuge would be impractical.

C. For the combined refuge option (i.e. the lepidopteran refuge combined with the rootworm refuge by planting non-Bt corn), the refuge must be planted and managed such that it is consistent with the requirements of the individual traits, as follows:

1. **Refuge size** shall be 20% in all corn-growing areas.

2. **Refuge location.** The combined refuge is required to be planted within or adjacent (e.g. across the road) to the Optimum Intrasect Xtra field.

3. **Refuge management options**
   • The in-field refuge options must be planted as a single block or as a series of strips measuring at least four (4) consecutive crop rows wide.
   • Seed mixtures of Optimum Intrasect Xtra and refuge corn are not permitted.
   • If the combined refuge is planted on rotated ground, then the Optimum Intrasect Xtra must also be planted on rotated ground.
   • If the combined refuge is planted on continuous corn, the Optimum Intrasect Xtra field may be planted on either continuous or rotated land (option encouraged where WCRW rotation-resistant biotype may be present).
   • Application of soil insecticide for corn rootworm control is permitted in the combined refuge.
   • Seed treatment is permitted in the combined refuge, either at a rate for rootworm protection or at a rate for controlling secondary soil pests.
   • If aerial insecticides are applied to the combined refuge for control of CRW adults, the same treatment must also be applied in the same timeframe to Optimum Intrasect Xtra.
   • Insecticide treatments in the combined refuge for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, sugarcane borer, lesser corn stalk borer, stalk borer or southern corn stalk borer may be applied only if economic thresholds are reached for one or more of these target pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g. Extension Service Agents, crop consultants). These pests can be treated with CRW-labeled insecticide on the combined refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present. Instructions to growers will specify that microbial Bt insecticides must not be applied to the combined refuges.
   • Pests other than adult corn rootworms can be treated with CRW-labeled insecticide on the combined refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present. Pests on the Optimum Intrasect Xtra acres can be treated as needed without having to treat the refuge.
   • The combined refuge can be planted to any corn hybrid that does not express PIPs for lepidopteran or rootworm control (i.e. herbicide tolerant corn or conventional corn).
   • The combined refuge and Optimum Intrasect Xtra 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.
### Use Pattern

<table>
<thead>
<tr>
<th>Crop</th>
<th>Pests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field corn</td>
<td>black cutworm</td>
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<td></td>
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<td></td>
<td>northern corn rootworm</td>
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<tr>
<td></td>
<td>Mexican corn rootworm</td>
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</tbody>
</table>
**Optimum® Intrasect® Xtra**

(OECD Unique Identifier: DAS-Ø15Ø7-1xDAS-59122-7xMON-ØØ81Ø-6)

**Active Ingredients:**

*Bacillus thuringiensis* Cry1F protein and the genetic material (plasmid insert PHI8999A) necessary for its production in corn event DAS-Ø15Ø7-1 ............................................................... ≤0.0011%*

*Bacillus thuringiensis* Cry34Ab1 protein and the genetic material (PHP17662 T-DNA) necessary for its production in corn event DAS-59122-7 ...................................................................... ≤0.0054%

*Bacillus thuringiensis* Cry35Ab1 protein and the genetic material (PHP17662 T-DNA) necessary for its production in corn event DAS-59122-7 .......................................................... ≤0.0042%*

*Bacillus thuringiensis* Cry1Ab protein and the genetic material (vector PV-ZMBK07) necessary for its production in corn event MON-ØØ81Ø-6 ........................................................... ≤0.0015%*

**Other Ingredient:**

Phosphinothricin acetyltransferase (PAT) protein and the genetic material (plasmid insert PHI8999A and PHP17662 T-DNA) necessary for its production in corn events DAS-Ø15Ø7-1 and DAS-59122-7 .......................................................................................... ≤0.0013%*

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

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

NET CONTENTS ________________

EPA REGISTRATION NUMBER: 29964-8

EPA ESTABLISHMENT NUMBER: 029964-IA-001

Pioneer Hi-Bred International, Inc.
7300 NW 62nd Avenue
Johnston, IA 50131
DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

The plant-incorporated protectant must be used as specified in the terms and conditions of the registration.

Optimum® Intrasect® Xtra combines the insect protection features of Herculex®1 XTRA (EPA Reg. No.: 29964-5) and YIELDGARD®2 Corn Borer (EPA Reg. No.: 524-489) in the same corn hybrid or inbred. Optimum Intrasect Xtra hybrids protect corn crops from leaf, stalk and ear damage caused by lepidopteran corn pests such as the European corn borer and root damage caused by corn rootworm larvae. In order to minimize the risk of the corn pests developing resistance to Optimum Intrasect Xtra, an insect resistance management plan must be implemented.

INSECT RESISTANCE MANAGEMENT

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 active ingredient per registrant per year.

Corn seed bags or bag tags for products containing Optimum Intrasect Xtra must include the refuge size requirement in text and graphical format.

Growers are instructed to read information on insect resistance management. The following information regarding refuge placement for commercial production must be included in the Grower Guide:

The use of Optimum Intrasect Xtra requires accompanying refuge corn for the Cry1F, Cry1Ab and Cry34/35Ab1 components that meets the requirements of the individual traits, described below. The refuge(s) for these traits may be combined by planting non-Bacillus thuringiensis (Bt) corn as the refuge (see C. below), or the refuge for each trait may be planted separately (see A. and B. below).

For the separate refuges, corn rootworm-resistant Bt corn (e.g., Herculex® RW; EPA Reg. No.: 29964-4) may be planted in the lepidopteran refuge for the Cry1F and Cry1Ab components and lepidopteran-resistant Bt corn (e.g., Herculex® I; EPA Reg. No.: 29964-3) may be planted in the corn rootworm refuge for the Cry34/35Ab1 component. Depending on cropping practices, pest problems, and pest management options employed on any given farm, growers may need to choose different refuge arrangements for different fields. Possible options include: two refuge blocks (one for rootworm, one for Lepidoptera) can be planted within one field, or strips can be used for either refuge. Alternatively, a block of Herculex® RW (EPA Reg. No.: 29964-4) can serve as an in-field lepidopteran refuge for one field planted to Optimum Intrasect Xtra and an external lepidopteran refuge for separate fields planted to Optimum Intrasect Xtra, while the rootworm refuge is planted as lepidopteran-resistant Bt corn (e.g., Herculex® I; EPA Reg. No.: 29964-3) in an external adjacent field. In all options, size and management of each individual refuge must be followed as described in A. and B below.

Other refuge designs and combinations are permissible as long as in all cases the size and management of each refuge are described in A., B., and C. below.

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1 Herculex® Insect Protection technology by Dow AgroSciences and Pioneer Hi-Bred. ®Herculex is a registered trademark of Dow AgroSciences LLC.
2 Yieldgard is a registered trademark used under the license from Monsanto Company.
A. Lepidopteran refuge for the Cry1F and Cry1Ab components.

1. **Refuge size.** In all Corn-growing Areas the use of Optimum Intrasect Xtra requires an accompanying 20% refuge consisting of non-Bt corn or corn that is not a lepidopteran-protected Bt hybrid.

2. **Refuge location.**
   - The lepidopteran refuge can be planted in a separate field within a ¼ mile of the Optimum Intrasect Xtra field.
   - The lepidopteran refuge can be planted within the Optimum Intrasect Xtra field as blocks (e.g. along the edges or headlands).
   - The lepidopteran refuge can be planted within the Optimum Intrasect Xtra field as strips across the field at least four (4) consecutive crop rows wide.

3. **Refuge management.**
   - Insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, sugarcane borer, stalk borer and southern corn stalk borer may be applied only if economic thresholds are reached for one or more of these target pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g. Extension Service Agents, crop consultants). Microbial Bt insecticides must not be applied to refuges consisting of non-Bt corn or corn that is not a lepidopteran-protected Bt hybrid.

B. Corn rootworm refuge for the Cry34/35Ab1 component.

1. **Refuge size.** The use of Optimum Intrasect Xtra requires an accompanying 20% refuge consisting of non-Bt corn or non-corn rootworm-resistant Bt corn.

2. **Refuge location.** The rootworm refuge is required to be planted within or adjacent (e.g. across the road) to the Optimum Intrasect Xtra field.

3. **Refuge management options.** The rootworm refuge can be managed in such a way that there is little or no yield loss to rootworms, but must be managed in a way that it is sufficiently productive of susceptible rootworm adults.
   - The in-field rootworm refuge options may be planted as a single block or as a series of strips measuring at least four (4) consecutive crop rows wide.
   - Seed mixtures of Optimum Intrasect Xtra and rootworm refuge corn are not permitted.
   - If the rootworm refuge is planted on rotated ground, then Optimum Intrasect Xtra must also be planted on rotated ground.
   - If the rootworm refuge is planted in continuous corn, the Optimum Intrasect Xtra field may be planted on either continuous or rotated land (option encouraged where WCRW rotation-resistant biotype may be present).
   - Application of soil insecticide is permitted in the rootworm refuge.
   - Seed treatment is permitted in the rootworm refuge, either at a rate for rootworm protection or at a rate for controlling secondary soil pests.
   - If aerial insecticides are applied to the rootworm refuge for control of CRW adults, the same treatment must also be applied in the same time-frame to Optimum Intrasect Xtra.
   - Pests other than adult corn rootworms can be treated on the rootworm refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. Pests on the Optimum Intrasect Xtra acres can be treated as needed without having to treat the rootworm refuge.
   - The rootworm refuge can be planted to any corn hybrid that does not express PIPs for rootworm control (e.g. lepidopteran-protected Bt corn, herbicide-tolerant corn, or conventional corn).
• The rootworm refuge and Optimum Intrasect Xtra 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.

• Growers are encouraged to plant the rootworm refuge in the same location each year, as it allows the rootworm population to remain high and the durability of the trait is extended. This option may be preferable to growers who wish to only think of their refuge design once and for growers who grow continuous corn. However, for those growers who need to employ crop rotation, a fixed refuge would be impractical.

C. For the combined refuge option (i.e. the lepidopteran refuge combined with the rootworm refuge by planting non-\textit{Bt} corn), the refuge must be planted and managed such that it is consistent with the requirements of the individual traits, as follows:

1. \textit{Refuge size} shall be 20\% in all corn-growing areas.

2. \textit{Refuge location}. The combined refuge is required to be planted within or adjacent (e.g. across the road) to the Optimum Intrasect Xtra field.

3. \textit{Refuge management options}
   - The in-field refuge options must be planted as a single block or as a series of strips measuring at least four (4) consecutive crop rows wide.
   - Seed mixtures of Optimum Intrasect Xtra and refuge corn are not permitted.
   - If the combined refuge is planted on rotated ground, then the Optimum Intrasect Xtra must also be planted on rotated ground.
   - If the combined refuge is planted on continuous corn, the Optimum Intrasect Xtra field may be planted on either continuous or rotated land (option encouraged where WCRW rotation-resistant biotype may be present).
   - Application of soil insecticide for corn rootworm control is permitted in the combined refuge.
   - Seed treatment is permitted in the combined refuge, either at a rate for rootworm protection or at a rate for controlling secondary soil pests.
   - If aerial insecticides are applied to the combined refuge for control of CRW adults, the same treatment must also be applied in the same timeframe to Optimum Intrasect Xtra.
   - Insecticide treatments in the combined refuge for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, sugarcane borer, lesser corn stalk borer, stalk borer or southern corn stalk borer may be applied only if economic thresholds are reached for one or more of these target pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g. Extension Service Agents, crop consultants). These pests can be treated with CRW-labeled insecticide on the combined refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present. Instructions to growers will specify that microbial \textit{Bt} insecticides must not be applied to the combined refuges.
   - Pests other than adult corn rootworms can be treated with CRW-labeled insecticide on the combined refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present. Pests on the Optimum Intrasect Xtra acres can be treated as needed without having to treat the refuge.
   - The combined refuge can be planted to any corn hybrid that does not express PIPs for lepidopteran or rootworm control (i.e. herbicide tolerant corn or conventional corn).
   - The combined refuge and Optimum Intrasect Xtra 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.
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Optimum® Intrasect® Xtra
(OECD Unique Identifier: DAS-Ø15Ø7-1xDAS-59122-7xMON-ØØ81Ø-6)

Active Ingredients:

*Bacillus thuringiensis* Cry1F protein and the genetic material (plasmid insert PHI8999A) necessary for its production in corn event DAS-Ø15Ø7-1 ........................................................... ≤0.0011%

*Bacillus thuringiensis* Cry34Ab1 protein and the genetic material (PHP17662 T-DNA) necessary for its production in corn event DAS-59122-7 ............................................................. ≤0.0054%

*Bacillus thuringiensis* Cry35Ab1 protein and the genetic material (PHP17662 T-DNA) necessary for its production in corn event DAS-59122-7 ............................................................. ≤0.0042%

*Bacillus thuringiensis* Cry1Ab protein and the genetic material (vector PV-ZMBK07) necessary for its production in corn event MON-ØØ81Ø-6 ............................................................. ≤0.0015%

Other Ingredient:

Phosphinothricin acetyltransferase (PAT) protein and the genetic material (plasmid insert PHI8999A and PHP17662 T-DNA) necessary for its production in corn events DAS-Ø15Ø7-1 and DAS-59122-7 ........................................................... ≤0.0013%

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

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

NET CONTENTS _______________

EPA REGISTRATION NUMBER: 29964-8

EPA ESTABLISHMENT NUMBER: 029964-IA-001

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7300 NW 62nd Avenue
Johnston, IA 50131
**DIRECTIONS FOR USE**

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**INSECT RESISTANCE MANAGEMENT**

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 active ingredient per registrant per year.

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For the separate refuges, corn rootworm-resistant *Bt* corn (e.g., Herculex® RW; EPA Reg. No.: 29964-4) may be planted in the lepidopteran refuge for the Cry1F and Cry1Ab components and lepidopteran-resistant *Bt* corn (e.g., Herculex® I; EPA Reg. No.: 29964-3) may be planted in the corn rootworm refuge for the Cry34/35Ab1 component. Depending on cropping practices, pest problems, and pest management options employed on any given farm, growers may need to choose different refuge arrangements for different fields. Possible options include: two refuge blocks (one for rootworm, one for Lepidoptera) can be planted within one field, or strips can be used for either refuge. Alternatively, a block of Herculex® RW (EPA Reg. No.: 29964-4) can serve as an in-field lepidopteran refuge for one field planted to Optimum Intrasect Xtra and an external lepidopteran refuge for separate fields planted to Optimum Intrasect Xtra, while the rootworm refuge is planted as lepidopteran-resistant *Bt* corn (e.g., Herculex® I; EPA Reg. No.: 29964-3) in an external adjacent field. In all options, size and management of each individual refuge must be followed as described in A. and B below.

Other refuge designs and combinations are permissible as long as in all cases the size and management of each refuge are described in A., B., and C. below.

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1 Herculex® Insect Protection technology by Dow AgroSciences and Pioneer Hi-Bred. 2Herculex is a registered trademark of Dow AgroSciences LLC.
2 Yieldgard is a registered trademark used under the license from Monsanto Company.
A. Lepidopteran refuge for the Cry1F and Cry1Ab components.

1. **Refuge size.** In all Corn-growing Areas the use of Optimum Intrasect Xtra requires an accompanying 20% refuge consisting of non-\(Bt\) corn or corn that is not a lepidopteran-protected \(Bt\) hybrid.

2. **Refuge location.**
   - The lepidopteran refuge can be planted in a separate field within a \(\frac{1}{2}\) mile of the Optimum Intrasect Xtra field.
   - The lepidopteran refuge can be planted within the Optimum Intrasect Xtra field as blocks (e.g. along the edges or headlands).
   - The lepidopteran refuge can be planted within the Optimum Intrasect Xtra field as strips across the field at least four (4) consecutive crop rows wide.

3. **Refuge management.**
   - Insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, sugarcane borer, stalk borer and southern corn stalk borer may be applied only if economic thresholds are reached for one or more of these target pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g. Extension Service Agents, crop consultants). Microbial \(Bt\) insecticides must not be applied to refuges consisting of non-\(Bt\) corn or corn that is not a lepidopteran-protected \(Bt\) hybrid.

B. Corn rootworm refuge for the Cry34/35Ab1 component.

1. **Refuge size.** The use of Optimum Intrasect Xtra requires an accompanying 20% refuge consisting of non-\(Bt\) corn or non-corn rootworm-resistant \(Bt\) corn.

2. **Refuge location.** The rootworm refuge is required to be planted within or adjacent (e.g. across the road) to the Optimum Intrasect Xtra field.

3. **Refuge management options.** The rootworm refuge can be managed in such a way that there is little or no yield loss to rootworms, but must be managed in a way that it is sufficiently productive of susceptible rootworm adults.
   - The in-field rootworm refuge options may be planted as a single block or as a series of strips measuring at least four (4) consecutive crop rows wide.
   - Seed mixtures of Optimum Intrasect Xtra and rootworm refuge corn are not permitted.
   - If the rootworm refuge is planted on rotated ground, then Optimum Intrasect Xtra must also be planted on rotated ground.
   - If the rootworm refuge is planted in continuous corn, the Optimum Intrasect Xtra field may be planted on either continuous or rotated land (option encouraged where WCRW rotation-resistant biotype may be present).
   - Application of soil insecticide is permitted in the rootworm refuge.
   - Seed treatment is permitted in the rootworm refuge, either at a rate for rootworm protection or at a rate for controlling secondary soil pests.
   - If aerial insecticides are applied to the rootworm refuge for control of CRW adults, the same treatment must also be applied in the same time-frame to Optimum Intrasect Xtra.
   - Pests other than adult corn rootworms can be treated on the rootworm refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. Pests on the Optimum Intrasect Xtra acres can be treated as needed without having to treat the rootworm refuge.
   - The rootworm refuge can be planted to any corn hybrid that does not express PIPs for rootworm control (e.g. lepidopteran-protected \(Bt\) corn, herbicide-tolerant corn, or conventional corn).
• The rootworm refuge and Optimum Intrasect Xtra 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.
• Growers are encouraged to plant the rootworm refuge in the same location each year, as it allows the rootworm population to remain high and the durability of the trait is extended. This option may be preferable to growers who wish to only think of their refuge design once and for growers who grow continuous corn. However, for those growers who need to employ crop rotation, a fixed refuge would be impractical.

C. For the combined refuge option (i.e. the lepidopteran refuge combined with the rootworm refuge by planting non-Bt corn), the refuge must be planted and managed such that it is consistent with the requirements of the individual traits, as follows:

1. **Refuge size** shall be 20% in all corn-growing areas.

2. **Refuge location.** The combined refuge is required to be planted within or adjacent (e.g. across the road) to the Optimum Intrasect Xtra field.

3. **Refuge management options**
   • The in-field refuge options must be planted as a single block or as a series of strips measuring at least four (4) consecutive crop rows wide.
   • Seed mixtures of Optimum Intrasect Xtra and refuge corn are not permitted.
   • If the combined refuge is planted on rotated ground, then the Optimum Intrasect Xtra must also be planted on rotated ground.
   • If the combined refuge is planted on continuous corn, the Optimum Intrasect Xtra field may be planted on either continuous or rotated land (option encouraged where WCRW rotation-resistant biotype may be present).
   • Application of soil insecticide for corn rootworm control is permitted in the combined refuge.
   • Seed treatment is permitted in the combined refuge, either at a rate for rootworm protection or at a rate for controlling secondary soil pests.
   • If aerial insecticides are applied to the combined refuge for control of CRW adults, the same treatment must also be applied in the same timeframe to Optimum Intrasect Xtra.
   • Insecticide treatments in the combined refuge for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, sugarcane borer, lesser corn stalk borer, stalk borer or southern corn stalk borer may be applied only if economic thresholds are reached for one or more of these target pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g. Extension Service Agents, crop consultants). These pests can be treated with CRW-labeled insecticide on the combined refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present. Instructions to growers will specify that microbial Bt insecticides must not be applied to the combined refuges.
   • Pests other than adult corn rootworms can be treated with CRW-labeled insecticide on the combined refuge acres without treating the Optimum Intrasect Xtra acres only if treatment occurs when adult corn rootworms are not present. Pests on the Optimum Intrasect Xtra acres can be treated as needed without having to treat the refuge.
   • The combined refuge can be planted to any corn hybrid that does not express PIPs for lepidopteran or rootworm control (i.e. herbicide tolerant corn or conventional corn).
   • The combined refuge and Optimum Intrasect Xtra 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.
Use Pattern

<table>
<thead>
<tr>
<th>Crop</th>
<th>Pests</th>
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<tbody>
<tr>
<td>Field corn</td>
<td>black cutworm</td>
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<tr>
<td></td>
<td>corn earworm</td>
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<tr>
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<td>European corn borer</td>
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<tr>
<td></td>
<td>fall armyworm</td>
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<tr>
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<td>southwestern corn borer</td>
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<td>western bean cutworm</td>
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<td></td>
<td>western corn rootworm</td>
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<tr>
<td></td>
<td>northern corn rootworm</td>
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<tr>
<td></td>
<td>Mexican corn rootworm</td>
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