A REPORT OF THE

SUNFLOWER VARIETY REVIEW BOARD

ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES

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The Association of Official Seed Certifying Agencies (AOSCA) Sunflower Variety Review Board (SFVRB), reviewed the following varieties on May 14, 2020. The Board recommended the inclusion of these varieties for certification. Seed of these varieties may be certified, providing production meets all standards of the Certifying Agency of the jurisdiction in which the seed is grown.

All variety information, including descriptions, claims, and research data to support any claim was supplied to the Sunflower Variety Review Board by the applicants. The Sunflower Variety Review Board makes judgment regarding recommendation of varieties for inclusion in certification based on the data supplied. Beyond this, the Sunflower Variety Review Board takes no position on the accuracy or truthfulness of any description or claim made by the applicants.

Further information on current procedures, application forms, and details regarding the Sunflower Variety Review Board can be obtained from:

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Association of Official Seed Certifying Agencies
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Respectfully submitted,

Stephen Sebesta, Chairman
Sunflower Variety Review Board
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Sunflower

HT1260R

1. 
HT1260R is an imidazolinone resistant, oilseed restorer line developed by the pedigree and backcross method of selection from the cross 6314R*2/RHA426. 6314R is a Nuseed proprietary restorer line. RHA426 is the donor for imidazolinone released by USDA. The pedigree and backcross method of selection was used for the development of HT1260R. It is a bulk of BC1F7 plants tracing back to a single BC1F6 plant. Selection was based on early flowering, uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. 
Hybrids utilizing HT1260R are adapted to Northern sunflower growing regions of North America, and SE Europe, the hybrids will be primarily for vegetable oil.

3. 
Flowering (relatively early, medium, or late?): early
Height (relatively short, medium, or tall?): short
Branching Type: present, overall
Distal Leaf Shape: narrow triangular
Leaf Attitude: low
Leaf Color: medium green
Leaf Serration: fine
Leaf Blistering: absent or very weak
Ray Flowers: narrow ovoidal
Ray Flowers: medium density, narrow ovate
Ray Flowers: longitudinal recurved, medium length
Stigma Anthocyanin: absent
Pappi Color: green
Disk Flower Color: yellow
Ray Flower Color: medium yellow
Head (neck) Attitude: half-turned down with curved stem
Hypocotyl Anthocyanin: absent
Seed Shape: elongated
Pollen Color: yellow
Head Shape: flat
Seed Thickness: thin
Seed Outer Pericarp Color: black
State Appearance: marginal: none or weakly expressed center: none or weakly expressed color: black

4. 
None expected.

5. 
HT1260R is resistant to imidazolinone herbicide.

6. 
Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for the production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

7. 
Certified seed is expected to be available in 2020, do not publish certified production acreage.

No plan for PVP at this time. Do not provide information to the PVP database.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY
Date this application was submitted: Mar 17, 2020 Date recommended by the VRB: Jul 1, 2020

Association of Official Seed Certifying Agencies
Sunflower

KDM4039B

1. KDM4039B is an imidazolinone resistant, high oleic, confectionary maintainer line developed by the pedigree method of selection from the cross SA445B/SA436B. SA445B and SA436B are proprietary lines with preferred agronomic characteristics. The pedigree method of selection was used for the development of KDM4039B. It is a bulk of F6 plants tracing back to a single F5 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KDM4039B are adapted to major sunflower growing regions of North America and Europe; the hybrids will be used primarily for human consumption.

3. Flowering (relatively early, medium, or late?): medium
   Height (relatively short, medium or tall?): tall
   Branching Type: absent,
   Distal Leaf Shape: broad triangular
   Leaf Attitude: medium
   Leaf Color: medium green
   Ray Flowers: dense, broad ovate
   Leaf Serration: coarse
   Leaf Blistering: weak
   Ray Flower Color: medium yellow
   Stigma Anthocyanin: absent,
   Flat, medium length
   Pappi Color: green
   Head (neck) Attitude: turned down with slightly curved stem
   Pollen Color: yellow
   Seed Shape: rounded
   Head Shape: weakly concave
   Seed Thickness: thick
   Seed Outer Pericarp Color: grey
   Hypocotyl Anthocyanin: absent,
   Marginal: strongly expressed center: weakly expressed color: white

4. None expected variants or other varietal information not described above (if none, state “none”).

5. KDM4039B is resistant to imidazolinone herbicide as shown in the attached document. Otherwise it has no known insect or disease tolerance.

6. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

7. Certified seed is expected to be first available in 2021. Do not publish certified seed production acreage.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY
Date this application was submitted: ________________ Date recommended by the VRB: ________________
Sunflower

KDM6588R

1. KDM6588R is an imidazolinone resistant, high oleic, confectionary restorer line developed by the pedigree and backcross method of selection from the cross WSM3988R/WSM3959R*3/KDM4066R. WSM3988R, WSM3959R, and KDM4066R are proprietary lines with preferred agronomic characteristics. The pedigree and backcross method of selection was used for the development of KDM6588R. It is a bulk of BC2F5 plants tracing back to a single BC2F4 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KDM6588R are adapted to major sunflower growing regions of North America and Europe; the hybrids will be used primarily for human consumption.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): medium
   Branching Type: present, overall
   Distal Leaf Shape: broad triangular
   Leaf Attitude: medium
   Leaf Color: medium green
   Leaf Serration: coarse
   Leaf Blistering: weak
   Ray Flowers: medium density, narrow ovate
   Stigma Anthocyanin: absent,
   Flat, medium length
   Pappi Color: green
   Disk Flower Color: yellow
   Head (neck) Attitude: turned down with slightly curved stem
   Pollen Color: yellow
   Seed Shape: elongated
   Seed Thickness: medium
   Seed Outer Pericarp Color: dark brown
   Hypocotyl Anthocyanin: absent,
   Stripe Appearance: marginal: strongly expressed center: weakly expressed color: white

   State expected variants or other variety information not described above (if none, state "none")

   None

4. KDM6588R is resistant to imidazolinone herbicide as shown in the attached document. Otherwise it has no known insect or disease tolerance.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. Certified seed is expected to first be available in 2021. Do not publish certified seed production acreage.

7. KDM6588R will not be submitted for PVP.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY

Date this application was submitted: ______________________ Date recommended by the VRB: ____________________

Association of Official Seed Certifying Agencies 2020 SUNFLOWER VRB
Sunflower

KDM6590R

1. KDM6590R is an imidazolinone resistant, high oleic, confectionary restorer line developed by the pedigree and backcross method of selection from the cross WSM3988R/WSM3959R*3/KDM4066R. WSM3988R, WSM3959R, and KDM4066R are proprietary lines with preferred agronomic characteristics. The pedigree and backcross method of selection was used for the development of KDM6590R. It is a bulk of BC2F6 plants tracing back to a single BC2F5 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KDM6590R are adapted to major sunflower growing regions of North America and Europe; the hybrids will be used primarily for human consumption.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): medium
   Branching Type: present, overall
   Distal Leaf Shape: broad triangular
   Leaf Attitude: medium
   Leaf Color: medium green
   Ray Flowers: medium density, narrow ovate, flat, medium length
   Disk Flower Color: yellow
   Pollen Color: yellow
   Head Shape: weakly concave
   Seed Outer Pericarp Color: dark brown
   Head (neck) Attitude: turned down with slightly curved stem
   Leaf Serration: coarse
   Leaf Blistering: weak
   Ray Flower Color: orange yellow
   Stigma Anthocyanin: absent
   Pappi Color: green
   Seed Shape: elongated
   Seed Thickness: medium
   Hypocotyl Anthocyanin: absent
   Marginal: strongly expressed
center: weakly expressed
color: white

State expected variants or other varietal information not described above (if none, state "none")

None

4. KDM6590R is resistant to imidazolinone herbicide as shown in the attached document. Otherwise it has no known insect or disease tolerance.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. Certified seed is expected to first be available in 2021. Do not publish certified seed production acreage.

7. KDM6590R will not be submitted for PVP.

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Date this application was submitted: ____________________ Date recommended by the VRB: ____________________

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**Sunflower**

**KH6492R**

1. **KH6492R** is a high oleic, imidazolinone resistant, oilseed restorer line developed by the pedigree and backcross method of selection from the cross K12HE69R6/K12HE62R. K12HE69R is a proprietary high oleic, imidazolinone resistant restorer that has been described and previously approved by the NSVRB. K12HE62R is a proprietary high oleic, triburon-methyl resistant, oilseed restorer line previously described and approved by the NSVRB.

   The pedigree and backcross method of selection was used for the development of KH6492R. It is a bulk of BC5F7 plants tracing back to a single BC5F6 plant. Selection was based on early flowering, oil profile, uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KH6492R are adapted to Northern sunflower growing regions of North America, Ukraine, and Russia: the hybrids will be primarily for vegetable oil.

3. **Flowering (relatively early, medium, or late?):** very early  
   **Height (relatively short, medium or tall?):** short  
   **Branching Type:** present, predominantly apical  
   **Distal Leaf Shape:** narrow triangular to broad triangular  
   **Leaf Attitude:** medium  
   **Leaf Color:** medium green  
   **Leaf Serration:** medium  
   **Leaf Blistering:** absent or very weak  
   **Ray Flowers:** medium density, narrow ovate  
   **Ray Flower Color:** light yellow  
   **Longitudinal recurved, medium length:**  
   **Pappi Color:** green  
   **Disk Flower Color:** yellow  
   **Head (neck) Attitude:** half-turned down with straight stem  
   **Pollen Color:** yellow  
   **Seed Shape:** ovate wide  
   **Head Shape:** flat  
   **Seed Thickness:** thin  
   **Seed Outer Pericarp Color:** grey  
   **Hypocotyl Anthocyanin:** absent  
   **Stripe Appearance:** marginal: none or weakly expressed center: none or weakly expressed color: grey

   State expected variants or other varietal information not described above (if none, state “none”)

   None expected.

4. **KH6492R** is resistant to imidazolinone herbicide.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for the production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. **Certified seed is expected to be available in 2020,** do not publish certified production acreage.

7. No plan for PVP at this time. Do not provide information to the PVP database.

**INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY**

Date this application was submitted: _______________ Date recommended by the VRB: _______________

Association of Official Seed Certifying Agencies 2020 SUNFLOWER VRB
Sunflower

KHMS8104B

1. KHMS8104B is a high oleic, imidazolinone resistant, canola seed maintainer line developed by the pedigree and backcross method of selection from the cross SA6896B'4/KLN4528B. SA6896B is a proprietary high oleic, imidazolinone resistant maintainer that has been described and previously approved by the NSVRC. KLN4528B is a proprietary line with preferred agronomic characteristics, derived from HAB9.

The pedigree and backcross method of selection was used for the development of KHMS8104B. It is a bulk of BC3F7 plants tracing back to a single BC3F6 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KHMS8104B are adapted to major sunflower growing regions of North America, and SE Europe. the hybrids will be primarily for vegetable oil.

3. Flowering (relatively early, medium, or late?): medium
   Height (relatively short, medium or tall?): medium
   Branching Type: absent
   Distal Leaf Shape: broad triangular
   Leaf Attitude: low
   Leaf Color: dark green
   Leaf Serration: coarse
   Leaf Blistering: absent or very weak
   Ray Flower Color: light yellow
   Ray Flowers: medium density, broad ovate
   Pappi Color: green
   Ray Flowers: medium density, broad ovate
   Head (neck) Attitude: half turned down with curved stem
   Pollen Color: yellow
   Pollen Shape: elongated
   Seed Shape: flat
   Seed Thickness: thin
   Seed Outer Pericarp Color: grey
   Seed Outer Pericarp Color: grey
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color: grey

State expected variants or other varietal information not described above (if none, state "none"): None expected.

4. KHMS8104B is resistant to imidazolinone herbicide, and Downey mildew races that are controlled by the PL6 gene.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for the production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. **Certified seed is expected to be available in 2020**, do not publish certified production acreage.

7. No plan for PVP at this time. Do not provide information to the PVP database.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY

Date this application was submitted: ___________________________ Date recommended by the VRB: ___________________________

Association of Official Seed Certifying Agencies

2020 SUNFLOWER VRB
Sunflower

**KHM8141B**

1. **KHM8141B** is an oleic, imidazolinone resistant, cilsed maintainer line developed by the pedigree and backcross method of selection from the cross SA6896B*4/KHE3357B. SA6896B is a proprietary high oleic, imidazolinone resistant maintainers that has been described and previously approved by the NSVIB. KHE3357B is a proprietary line with preferred agronomic characteristics, derived from HA458.

   The pedigree and backcross method of selection was used for the development of KHM8141B. It is a bulk of BC3F7 plants tracing back to a single BC3F6 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KHM8141B are adapted to major sunflower growing regions of North America, and SE Europe: the hybrids will be primarily for vegetable oil.

3. **Flowering (relatively early, medium, or late?):** medium
   **Height (relatively short, medium or tall?):** medium
   **Branching Type:** absent,
   **Distal Leaf Shape:** broad triangular
   **Leaf Attitude:** low
   **Leaf Color:** dark green
   **Ray Flowers:** medium density, broad ovate
   **Leaf Serration:** coarse
   **Leaf Blistering:** absent or very weak
   **Ray Flower Color:** light yellow
   **Stigma Anthocyanin:** absent,
   **Pappi Color:** green
   **Disk Flower Color:** yellow
   **Head (neck) Attitude:** half turned down with curved stem
   **Pollen Color:** yellow
   **Seed Shape:** elongated
   **Head Shape:** flat
   **Seed Thickness:** thin
   **Seed Outer Pericarp Color:** grey
   **Hypocotyl Anthocyanin:** absent,
   **Striped Appearance:** marginal: none or weakly expressed center: none or weakly expressed color: grey

   State expected variants or other varietal information not described above (if none, state “none”).

   None expected.

4. **KHM8141B** is resistant to imidazolinone herbicide, and Downey mildew races that are controlled by the PL17 gene.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for the production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. **Certified seed is expected to be available in 2020,** do not publish certified production acreage.

7. No plan for PVP at this time. Do not provide information to the PVP database.

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Date this application was submitted: ____________________ Date recommended by the VRB: ____________________

Association of Official Seed Certifying Agencies

2020 SUNFLOWER VRB
Sunflower

KLM8101B

1. KLM8101B is a linoleic, imidazolinone resistant, oilseed maintainer line developed by the pedigree and backcross method of selection from the cross SA6896B4/KLM4528B. SA6896B is a proprietary, imidazolinone resistant maintainer that has been described and previously approved by the NSVRB. KLM4528B is a proprietary line with preferred agronomic characteristics, derived from HA89.

The pedigree and backcross method of selection was used for the development of KLM8101B. It is a bulk of BC3F7 plants tracing back to a single BC3F6 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KLM8101B are adapted to major sunflower growing regions of North America, and SE Europe; the hybrids will be primarily for vegetable oil.

3. Flowering (relatively early, medium, or late?): medium
   Height (relatively short, medium or tall?): medium
   Branching Type: absent,
   Distal Leaf Shape: broad triangular
   Leaf Attitude: low
   Leaf Color: dark green
   Ray Flowers: medium density, broad ovate
   Stigma Anthocyanin: absent,
   Pappi Color: green
   Disk Flower Color: yellow
   Head (neck) Attitude: half turned down with curved stem
   Pollen Color: yellow
   Seed Shape: elongated
   Seed Thickness: thin
   Seed Outer Pericarp Color: grey
   Hypocotyl Anthocyanin: absent,
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color: grey

State expected variants or other varietal information not described above (if none, state "none").

None expected.

4. KLM8101B is resistant to imidazolinone herbicide, and Downey mildew races that are controlled by the PL6 gene.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for the production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. **Certified seed is expected to be available in 2020,** do not publish certified production acreage.

7. No plan for PVP at this time. Do not provide information to the PVP database.

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Association of Official Seed Certifying Agencies

2020 SUNFLOWER VRB
Sunflower

KSM4046B

KSM4046B is an imidazolinone resistant, linoleic, confectionary maintainer line developed by the pedigree and backcross method of selection from the cross SA96118*3/SA443B/SA440B. SA96118, SA443B, and SA440B are proprietary lines with preferred agronomic characteristics.

The pedigree and backcross method of selection was used for the development of KSM4046B. It is a bulk of BC2F4 plants tracing back to a single BC2F3 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

Hybrids utilizing KSM4046B are adapted to major sunflower growing regions of North America and Europe; the hybrids will be used primarily for human consumption.

3. Flowering (relatively early, medium, or late?): medium
   Height (relatively short, medium or tall?): medium
   Branching Type: absent,
   Distal Leaf Shape: narrow triangular to broad triangular
   Leaf Attitude: medium
   Leaf Color: medium green
   Leaf Serration: medium
   Leaf Blistering: absent or very weak
   Ray Flower Color: medium yellow
   Ray Flowers: medium density, narrow ovate
   Stigma Anthocyanin: absent,
   Pappi Color: green
   Flat, medium length
   Disk Flower Color: yellow
   Head (neck) Attitude: half-turned down with curved stem
   Pollen Color: yellow
   Seed Shape: ovoid elongated
   Seed Shape: flat
   Seed Thickness: medium
   Seed Outer Pericarp Color: grey
   Hypocotyl Anthocyanin: absent,
   Stripe Appearance: marginal: strongly expressed center: none or weakly expressed color: white

State expected variants or other varietal information not described above (if none, state “none”)

None

4. KSM4046B is resistant to imidazolinone herbicide as shown in the attached document. Otherwise it has no known insect or disease tolerance.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. Certified seed is expected to first be available in 2021. Do not publish certified seed production acreage.

7. KSM4046B will not be submitted for PVP.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY

Date this application was submitted: __________________ Date recommended by the VRB: __________________

Association of Official Seed Certifying Agencies

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2020 SUNFLOWER VRB
**Sunflower**

**KSM7398B**

KSM7398B is an imidazolinone resistant, linoleic, confectionary maintainer line developed by the pedigree and backcross method of selection from the cross SA398B*3/S4A79B. SA398B and SA479B are proprietary lines with preferred agronomic characteristics. The pedigree and backcross method of selection was used for the development of KSM7398B. It is a bulk of BC2F4 plants tracing back to a single BC2F3 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KSM7398B are adapted to major sunflower growing regions of North America and Europe; the hybrids will be used primarily for human consumption.

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<tr>
<td>Flowering (relatively early, medium, or late?)</td>
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</tr>
<tr>
<td>Height (relatively short, medium or tall?)</td>
<td></td>
</tr>
<tr>
<td>Branching Type</td>
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</tr>
<tr>
<td>Distal Leaf Shape</td>
<td>narrow triangular to broad triangular</td>
</tr>
<tr>
<td>Leaf Attitude</td>
<td>medium</td>
</tr>
<tr>
<td>Leaf Color</td>
<td>medium green</td>
</tr>
<tr>
<td>Leaf Serration</td>
<td>medium</td>
</tr>
<tr>
<td>Leaf Blistering</td>
<td>weak</td>
</tr>
<tr>
<td>Ray Flowers</td>
<td>dense, narrow ovate</td>
</tr>
<tr>
<td>Stigma Anthocyanin</td>
<td>absent,</td>
</tr>
<tr>
<td>Pappi Color</td>
<td>green</td>
</tr>
<tr>
<td>Disk Flower Color</td>
<td>yellow</td>
</tr>
<tr>
<td>Head (neck) Attitude</td>
<td>half-turned down with curved stem</td>
</tr>
<tr>
<td>Pollen Color</td>
<td>yellow</td>
</tr>
<tr>
<td>Seed Shape</td>
<td>ovoid elongated</td>
</tr>
<tr>
<td>Seed Outer Pericarp Color</td>
<td>dark brown</td>
</tr>
<tr>
<td>Hypocotyl Anthocyanin</td>
<td>absent,</td>
</tr>
<tr>
<td>Stripe Appearance</td>
<td>marginal: strongly expressed center: weakly expressed color: white</td>
</tr>
</tbody>
</table>

State expected variants or other varietal information not described above (if none, state “none”)

None

4. KSM7398B is resistant to imidazolinone herbicide as shown in the attached document. Otherwise it has no known insect or disease tolerance.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

Certified seed is expected to first be available in 2021. Do not publish certified seed production acreage.

7. KSM7398B will not be submitted for PVP.

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Sunflower
KSP7944R

1. KSP7944R is an imidazolinone resistant, linoleic confectionary restorer line developed by the pedigree and backcross method of selection from the cross WSM3988R*3/WSM3959R*2/SA721R WSM3988R, WSM3959R, and SA721R are proprietary lines with preferred agronomic characteristics.

The pedigree and backcross method of selection was used for the development of KSP7944R. It is a bulk of BC2F5 plants tracing back to a single BC2F4 plant. Selection was based on uniform plant type, self compatibility, seed size, seed color, and resistance to imidazolinone herbicide.

2. Hybrids utilizing KSP7944R are adapted to major sunflower growing regions of North America and Europe; the hybrids will be used primarily for human consumption.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): medium
   Branching Type: present, overall
   Distal Leaf Shape: narrow triangular to broad triangular
   Leaf Serration: medium
   Leaf Attitude: medium
   Leaf Blistering: weak
   Leaf Color: medium green
   Ray Flower Color: medium yellow
   Ray Flowers: medium density, narrow ovate
   Stigma Anthocyanin: present, medium
   Flat, medium length
   Pappi Color: purple
   Disk Flower Color: yellow
   Head (neck) Attitude: half-turned down with curved stem
   Pollen Color: yellow
   Seed Shape: elongated
   Head Shape: flat
   Seed Thickness: thin
   Seed Outer Pericarp Color: black
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal weakly expressed center: weakly expressed color: brown

State expected variants or other varietal information not described above (if none, state "none").

None

4. KSP7944R is resistant to imidazolinone herbicide as shown in the attached document. Otherwise it has no known insect or disease tolerance.

5. Breeders seed will be maintained by Nuseed Americas in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be in accordance with the seed certification regulations of the state where it is produced.

6. Certified seed is expected to first be available in 2021. Do not publish certified seed production acreage.

7. KSP7944R will not be submitted for PVP.

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CP160211B

1. CP160211B is linoleic oil type, imidazolinone resistant, maintainer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the backcross 394021B x 3/A/H757B/DEKAS.3940/3/H757B/DEKAS.3940/DP115508621. 394021B, H757B and DP115508621 are Agrigenetics Inc. D/B/A Mycogen Seeds lines. DEKAS.3940 is a commercial hybrid from Dekalb. Selections were made for imidazolinone resistance, oil content and recurrent parent traits.

The pedigree method was used in the development of CP160211B. It is a bulk of BC2F4 seed tracing back to a single BC2F3 selection. The sterile analog derives from the CMS PET1 cytoplasm following 2 generations of backcrossing. It is homozygous dominant for single heads.

2. Hybrids utilizing CP160211B have been tested and are adapted to the growing regions of the North, Central and South of Argentina.

3. Flowering (relatively early, medium, or late?): late

Height (relatively short, medium or tall?): medium

Branching Type: absent,

Distal Leaf Shape: broad triangular to rounded

Leaf Attitude: high

Leaf Color: medium green

Ray Flowers: medium density, narrow ovate

Ray Flower Color: orange yellow

Longitudinal recurved, long

Disk Flower Color: orange

Pollen Color: yellow

Head Shape: weakly concave

Seed Outer Pericarp Color: black

Hypocotyl Anthocyanin: absent,

State expected variants or other varietal information not described above (if none, state "none")

CP160211B is a linoleic oil type, imidazolinone resistant, maintainer line. Compared to the public line HA89, CP160211B blooms and matures later and is taller. The broad triangular to rounder leaves are weakly concave. The ray florets are orange yellow and longitudinal recurved. The head attitude is half-turned down with straight stem. The seed is ovoid wide, longer & heavier.

4. This variety is resistant to imidazolinone herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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Sunflower
CP171978R

1. CP171978R is linoleic oil type imidazolinone resistant restorer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the backcross V15DS14197R*3/4/CP6798R/3/CN6798R*6//OND163R/CN117R. V15DS14197R, CP6798R, CN6798R, OND163R and CN117R are Agrigenetics Inc. D/B/A Mycogen Seeds lines. Selections were made for imidazolinone resistance, oil content, yield and recurrent parent traits.

The pedigree method was used in the development of CP171978R. It is a bulk of BC2F3 seed tracing back to a single BC2F2 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing CP171978R have been tested and are adapted to the growing regions of the North, Central and South of Argentina.

3. Flowering (relatively early, medium, or late?): very late
Height (relatively short, medium or tall?): tall
Branching Type: present, predominantly apical
Distal Leaf Shape: broad triangular
Leaf Attitude: medium
Leaf Serration: medium
Leaf Blistering: absent or very weak
Leaf Color: medium green
Ray Flower Color: orange yellow
Ray Flowers: medium density, narrow ovate
Stigma Anthocyanin: absent
Pappi Color: green
Disk Flower Color: orange
Head (neck) Attitude: turned down with slightly curved stem
Pollen Color: yellow
Seed Shape: ovoid elongated
Head Shape: weakly convex
Seed Thickness: medium
Seed Outer Pericarp Color: black
Hypocotyl Anthocyanin: present, weak
Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color

State expected variants or other varietal information not described above (if none, state “none”)
CP171978R is a linoleic oil type, imidazolinone resistant restorer line. Compared to the public line RHA274, CP171978R blooms later and is significantly taller. The broad triangular leaves are flat with medium serration. The seed is ovoid elongate and heavier than RHA274. The seeds are black with no stripes. Hypocotyl anthocyanin is present in weak intensity.

4. This variety is resistant to imidazolinone herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY
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2020 SUNFLOWER VRB
1. CPA166781R is linoleic oil type imidazolinone resistant restorer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the backcross CP6798R'2/RHA464/CN6798R. CP6798R and CN6798R are Agrigenetics Inc. D/B/A Mycogen Seeds lines. RHA464 is restorer oilseed germplasm released by the USDA-ARS and the North Dakota Agricultural Experiment Station. Selections were made for imidazolinone resistance, oil content, yield and recurrent parent traits. The pedigree method was used in the development of CPA166781R. It is a bulk of BC1F4 seed tracing back to a single BC1F3 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing CPA166781R have been tested and are adapted to the growing regions of the North, Central and South of Argentina.

3. Flowering (relatively early, medium, or late?): very late
   Height (relatively short, medium or tall?): medium
   Branching Type: present, predominantly apical
   Distal Leaf Shape: narrow triangular
   Leaf Serration: medium
   Leaf Attitude: low
   Leaf Blistering: absent or very weak
   Leaf Color: medium green
   Ray Flower Color: orange yellow
   Ray Flowers: medium density, narrow ovate
   Stigma Anthocyanin: absent
   Longitudinal recurved, medium length
   Pappi Color: green
   Head (neck) Attitude: half-turned down with straight stem
   Pollen Color: black
   Seed Shape: ovate elongated
   Seed Thickness: medium
   Seed Outer Pericarp Color: black
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color

4. State expected variants or other varietal information not described above (if none, state "none")
   CPA166781R is a linoleic oil type, imidazolinone restorer line. Compared to the public line RHA274, CPA166781R blooms later. The narrow triangular leaves are weakly concave with medium serration. The seed is ovate elongate, longer & heavier, than RHA274. The seeds are black with no stripes. Hypocotyl anthocyanin is absent.

5. This variety is resistant to imidazolinone herbicide.

6. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

7. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

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1. OI5731R is a high-oleic type, imidazolinone resistant, restorer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the backcross CN2731R×3/OIN587R, CN2731R and OIN587R are Agrigenetics Inc. D/B/A Mycogen Seeds lines. Selections were made for imidazolinone resistance, oil content, fatty acid profile, short plant stature, early flowering and yield. The pedigree method was used in the development of OI5731R. It is a bulk of BC2F3 seed tracing back to a single BC2F2 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing OI5731R have been tested and are adapted to the growing regions of the North, Central and South of Argentina.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): short
   Branching Type: present, only apical
   Distal Leaf Shape: broad triangular to rounded
   Leaf Attitude: low
   Leaf Color: medium green
   Ray Flowers: medium density, broad ovate
   Leaf Serration: medium
   Leaf Blistering: medium
   Ray Flower Color: medium yellow
   Stigma Anthocyanin: absent
   Longitudinal recurved, medium length
   Pappi Color: green
   Head (neck) Attitude: half-turned down with straight stem
   Pollen Color: yellow
   Seed Shape: rounded
   Seed Thickness: medium
   Seed Outer Pericarp: Color: black
   Hypocotyl Anthocyanin: present, weak
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color.

4. OI5731R is a high-oleic type, imidazolinone resistant restorer line. Compared to the public line RHA274, OI5731R blooms later and is significantly shorter. The broad triangular to rounder leaves have medium serration. The seed is rounded, shorter & heavier, than RHA274. The seeds that are black with no stripes. Hypocotyl anthocyanin is present in weak intensity.

5. This variety is resistant to imidazolinone herbicide.

6. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

7. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

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**OIT731R**

1. OIT731R is high-oleic oil type imidazolinone resistant restorer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the cross CN271R3/OIN587R/DP115461400. CN2731R, OIN587R and DP115461400 are Agrigenetics Inc. D/B/A Mycogen Seeds lines. Selections were made for imidazolinone resistance, oil content, shorter plant stature, earlier flowering and yield, as assessed in hybrid combination.

The pedigree method was used in the development of OIT731R. It is a bulk of F3 seed tracing back to a single F2 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing OIT731R have been tested and are adapted to the growing regions of the Northern Plains of the U.S. and North, Central and South of Argentina.

3. Flowering (relatively early, medium, or late?): very late
   Height (relatively short, medium or tall?): very short
   Branching Type: present, only apical
   Distal Leaf Shape: narrow triangular to broad triangular
   Leaf Serration: medium
   Leaf Attitude: low
   Leaf Blistering: medium
   Leaf Color: medium green
   Ray Flower Color: medium yellow
   Ray Flowers: sparse, fusiform
   Stigma Anthocyanin: absent
   Pappi Color: green
   Disk Flower Color: orange
   Head (neck) Attitude: half-turned down with curved stem
   Pollen Color: yellow
   Seed Shape: ovoid wide
   Seed Thickness: medium
   Seed Outer Pericarp Color: grey
   Hypocotyl Anthocyanin: present, weak
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color:

State expected variants or other varietal information not described above (if none, state “none”):

OIT731R is a high-oleic type, imidazolinone resistant restorer line. Compared to the public line RHA274, OIT731R blooms later and is significantly shorter. The narrow to broad triangular leaves are flat with small auricles. The seed is small broad ovoid and solid grey with no stripes. Hypocotyl anthocyanin is present in weak intensity.

4. This variety is resistant to imidazolinone herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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OP4861R

1. OP4861R is high-oleic type imidazolinone resistant restorer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the cross CN8861R/6/CN8861R/4/CN8861R*3/2/ON6725R/BT1-1R/3/CN8861R*5/H1063R/5/CN8861R*5/H1063R. CN8861R, ON6725R and H1063R are Agrigenetics Inc. D/B/A Mycogen Seeds lines. BT1-1R is a CLHA+ inbred licensed for use from BASF. BT1-1R is line used as the donor CLHA+ resistant. Selections were made for imidazolinone resistance, oil content, fatty acid profile and yield. The pedigree method was used in the development of OP4861R. It is a bulk of F3 seed tracing back to a single F2 selection. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.

2. Hybrids utilizing OP4861R have been tested and are adapted to the growing regions of the North, Central and South of Argentina.

3. Flowering (relatively early, medium, or late?): very late
   Height (relatively short, medium or tall?): medium
   Branching Type: present, predominantly apical
   Distal Leaf Shape: broad triangular
   Leaf Attitude: low
   Leaf Color: medium green
   Leaf Serration: medium
   Ray Flower Color: orange yellow
   Ray Flowers: medium density, narrow ovate
   Stigma Anthocyanin: absent
   Pappi Color: green
   Disk Flower Color: yellow
   Head (neck) Attitude: turned down with straight stem
   Pollen Color: yellow
   Seed Shape: ovoid wide
   Head Shape: weakly convex
   Seed Thickness: thin
   Seed Outer Pericarp Color: dark brown
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color

State expected variants or other varietal information not described above (if none, state "none")

OP4861R is a high-oleic type, imidazolinone resistant restorer line. OP4861R blooms later than public line RHA274. The broad triangular leaves have a weakly concave cross section. The seed is ovoid wide and heavier than RHA274. The seeds are dark brown with no stripes. Hypocotyl anthocyanin is absent.

4. This variety is resistant to imidazolinone herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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**OP5811B**

1. OP5811B is high oleic oil type, imidazolinone resistant, maintainer line developed by Agrigenetics Inc. D/B/A Mycogen Seeds that derives from the backcross CN9811B*2/3/CN9811B*4/BT1-1B//CN9811B*3/ONN879B. CN9811B, ONN879B are Agrigenetics Inc. D/B/A Mycogen Seeds lines. BT1-1B is the CLHA + inbred licensed for use from BASF. BT1-1B is line used as the donor CLHA+ resistant. Selections were made for imidazolinone resistance, oil content, fatty acid profile and recurrent parent traits.

   The pedigree method was used in the development of OP5811B. It is a bulk of BC1F4 seed tracing back to a single BC1F3 selection. The sterile analog derives from the CMS PET1 cytoplasm following 3 generations of backcrossing. It is homozygous dominant for single heads.

2. Hybrids utilizing OP5811B have been tested in and are adapted to the growing regions of the Northern Plains of the U.S., North, central and South of Argentina and Eastern, Central and Western Europe.

3. Flowering (relatively early, medium, or late?): very late
   
   Height (relatively short, medium or tall?): very tall
   
   Branching Type: absent,
   
   Distal Leaf Shape: broad triangular to rounded
   
   Leaf Serration: coarse
   
   Leaf Attitude: medium
   
   Leaf Blistering: weak
   
   Leaf Color: medium green
   
   Ray Flower Color: medium yellow
   
   Ray Flowers: medium density, fusiform
   
   Stigma Anthocyanin: absent,
   
   Pedicel Color: green
   
   Disk Flower Color: yellow
   
   Head (neck) Attitude: half-turned down with straight stem
   
   Pollen Color: yellow
   
   Seed Shape: ovoid wide
   
   Head Shape: weakly convex
   
   Seed Thickness: medium
   
   Seed Outer Pericarp Color: black
   
   Hypocotyl Anthocyanin: present, strong
   
   Stripe Appearance: marginal, strongly expressed; center, strongly expressed; color: white

   State expected variants or other varietal information not described above (if none, state “none”)

   OP5811B is a high oleic oil type, imidazolinone resistant, maintainer line. Compared to the public line HA89, OP5811B blooms and matures later and is taller. The broad triangular to rounded leaves are strongly concave. The ray florets are yellow, fusiform and undulated. The head attitude is half-turned down with straight stem. The ovoid elongated seed is longer than HA89.

4. This variety is resistant to imidazolinone herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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**7PAQB91R**

1. 7PAQB91R is a linoleic oil type restorer line developed by Pioneer Hi-Bred International that derives from the cross 7PKVL42R*4/F0998LM. Both 7PKVL42R & F0998LM are Pioneer proprietary lines. Selections were made for recurrent parent trait, shorter plant stature, oil content and yield, as assessed in hybrid combination. The pedigree method was used in the development of 7PAQB91R. It is a bulk of BC3F4 seed tracing back to a single BC3F3 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing 7PAQB91R have been tested in and are adapted to the growing regions of Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): short
   Branching Type: present, predominantly apical
   Distal Leaf Shape: broad triangular
   Leaf Attitude: medium
   Leaf Color: medium green
   Ray Flowers: medium density, broad ovate
   Leaf Serration: medium
   Leaf Blistering: medium
   Ray Flower Color: medium yellow
   Stigma Anthocyanin: absent
   Flat, medium length
   Pappi Color: green
   Disk Flower Color: orange
   Head (neck) Attitude: vertical
   Pollen Color: yellow
   Seed Shape: ovoid wide
   Seed Thickness: medium
   Seed Outer Pericarp Color: black
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal: strongly expressed center: strongly expressed color: grey

State expected variants or other varietal information not described above (if none, state “none”)

7PAQB91R is a linoleic type restorer line. Compared to the public line RHA274, 7PAQB91R blooms later and is a shorter line. The leaves are broad triangular. The yellow ray flowers are broad ovate and flat and the bracts are light green and short. 7PAQB91R has seed that are striped black with grey stripes, both marginally & laterally. Hypocotyl anthocyanin is absent.

4. 7PAQB91R claims no resistance to the common sunflower diseases and insect pests.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage

7. Application for protection under the Plant Variety Protection Act will not be made.

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7PBCH82R

1. 7PBCH82R is an oleic oil type restorer line developed by Pioneer Hi-Bred International that derives from the backcross D0250LM*5/PHS102R. Both D0250LM & PHS102R are Pioneer proprietary lines. PHS102R is a high oleic line used as the donor for high oleic trait. Selections were made for high oleic content and recurrent parent traits. The backcross method was used in the development of 7PBCH82R. It is a bulk of BC4F3 seed tracing back to a single BC4F2 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing 7PBCH82R have been tested in and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): early
   Height (relatively short, medium or tall?): very short
   Branching Type: present, overall
   Distal Leaf Shape: narrow triangular to broad triangular
   Leaf Attitude: low
   Leaf Color: medium green
   Leaf Serration: medium
   Leaf Blistering: medium
   Ray Flowers: medium density, broad ovate
   Papi Color: rust
   Ray Flower Color: light yellow
   Stigma Anthocyanin: absent
   Flat, medium length
   Flat
   Head (neck) Attitude: vertical
   Pollen Color: yellow
   Seed Shape: ovoid elongated
   Seed Thickness: thin
   Seed Outer Pericarp: color: black
   Hypocotyl Anthocyanin: present, medium
   Stripe Appearance: marginal: none or weakly expressed center: weakly expressed color: grey

4. State expected variants or other varietal information not described above (if none, state “none”) 7PBCH82R is an oleic oil type restorer line. Compared to the public line RHA274, 7PBCH82R blooming two days earlier and height is smaller. The narrow triangular to broad triangular leaves are medium green. The ray florets are light yellow and broad ovate shape. The seed is ovoid elongated and black with weak between margins grey stripes. Hypocotyl anthocyanin is present.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY
Date this application was submitted: ________________________ Date recommended by the VRB: ____________________
Sunflower
7PCUF12R

7PCUF12R is a tribenuron-methyl resistant, oleic oil type restorer line developed by Pioneer Hi-Bred International, Inc. It derives from the backcross PH5057R4/U09RFSULM. Both PH5057R & U09RFSULM are tribenuron-methyl resistant line and Pioneer proprietary lines. Selections were made for recurrent parent trait, oil and fatty acid content and yield, as assessed in hybrid combination.

The backcross method was used in the development of 7PCUF12R. It is a bulk of BC3F4 seed tracing back to a single BC3F3 selection. It is homozygous for dominant fertility restoration of the CMS PCT 1 cytoplasm.

Hybrids utilizing 7PCUF12R have been tested in and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

Flowering (relatively early, medium, or late?): late
Height (relatively short, medium or tall?): very short
Branching Type: present, predominantly apical
Distal Leaf Shape: broad triangular
Leaf Attitude: low
Leaf Color: medium green
Ray Flowers: medium density, fusiform
Head (neck) Attitude: vertical
Pollen Color: orange
Seed Shape: ovoid elongated
Head Shape: flat
Seed Outer Pericarp Color: black
Hypocotyl Anthocyanin: present, strong
Stripe Appearance: marginal: strongly expressed center: weakly expressed color: grey

State expected variants or other varietal information not described above (if none, state "none")
7PCUF12R is an oleic oil type, tribenuron-methyl resistant restorer line. Compared to the public line RHA274, 7PCUF12R blooms later and is shorter. The broad triangular leaves are green with fine serration. The yellow, fusiform, ray flowers are flat in disposition. The seed is ovoid elongated and black with grey stripes, both marginally & laterally. Hypocotyl anthocyanin is present.

This variety is resistant to tribenuron-methyl herbicide.

Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

Application for protection under the Plant Variety Protection Act will not be made.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY
Date this application was submitted: ____________________ Date recommended by the VRB: ____________________

Association of Official Seed Certifying Agencies
Sunflower
7PDCG09R

1. 7PDCG09R is a tribenuron-methyl resistant, linoleic oil type restorer line developed by Pioneer Hi-Bred International that derives from the cross U09KJLM/PH5045R. Both U09KJLM & PH5045R are Pioneer proprietary lines. PH5045R is a tribenuron-methyl resistant line used as the donor for herbicide resistance. Selections were made for tribenuron-methyl resistance, earlier flowering, shorter plant stature, oil content and yield, as assessed in hybrid combination. The pedigree method was used in the development of 7PDCG09R. It is a bulk of F7 seed tracing back to a single F6 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing 7PDCG09R have been tested in and are adapted to the growing regions of Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): medium
   Branching Type: present, predominantly apical
   Distal Leaf Shape: broad triangular to rounded
   Leaf Attitude: high
   Leaf Color: dark green
   Leaf Serration: fine
   Leaf Blistering: medium
   Ray Flower Color: medium yellow
   Ray Flowers: dense, broad ovate
   Stigma Anthocyanin: absent,
   Pappi Color: green
   Flat, short
   Disk Flower Color: orange
   Head (neck) Attitude: half-turned down with straight stem
   Pollen Color: yellow
   Seed Shape: ovoid wide
   Seed Thickness: medium
   Seed Outer Pericarp: Color: dark brown
   Hypocotyl Anthocyanin: absent,
   Stripe Appearance: marginal: strongly expressed center: weakly expressed color: brown

State expected variants or other varietal information not described above (if none, state "none")

7PDCG09R is a linoleic type, tribenuron-methyl resistant restorer line. Compared to the public line RHA274, 7PDCG09R blooms later. The dark green leaves are broad triangular to rounded. The dense yellow ray flowers are short, broad ovate and flat. The bracts are slightly embracing. 7PDCG09R has seed that are striped dark brown. Hypocotyl anthocyanin is absent.

4. 7PDCG09R is resistant to tribenuron-methyl herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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7PFCD33R

1. 7PFCD33R is a tribenuron-methyl resistant, oleic oil type restorer line developed by Pioneer Hi-Bred International that derives from the cross PHI5016R/T1295HM. PHI5016R & T1295HM are Pioneer proprietary lines. PHI5033R is a tribenuron-methyl resistant line used as the donor for herbicide resistance and T1295HM is an oleic line that was used as the donor for oil trait. Selections were made for tribenuron-methyl resistance, earlier flowering, shorter plant height, oil and fatty acid content and yield, as assessed in hybrid combination.

   The pedigree method was used in the development of 7PFCD33R It is a bulk of F7 seed tracing back to a single F6 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing 7PFCD33R have been tested in and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): late

   Height (relatively short, medium or tall?): very short

   Branching Type: present, overall

   Distal Leaf Shape: narrow triangular to broad triangular

   Leaf Attitude: medium

   Leaf Color: medium green

   Ray Flowers: dense, fusiform

   Flat, long

   Disk Flower Color: orange

   Pollen Color: yellow

   Head Shape: flat

   Head (neck) Attitude: vertical

   Seed Shape: ovoid elongated

   Seed Thickness: medium

   Seed Outer Pericarp Color: dark brown

   Hypocotyl Anthocyanin: present, weak

   Pappi Color: green

   Stigma Anthocyanin: absent.

   Leaf Serration: fine

   Leaf Blistering: weak

   Ray Flower Color: medium yellow

   State expected variants or other varietal information not described above (if none, state “none”)

   7PFCD33R is an oleic oil type, tribenuron-methyl resistant restorer line. Compared to the public line RHA274, 7PFCD33R is shorter. The narrow to broad triangular leaves are green with weak blistering. The disc flower stigma does not show anthocyanin. The yellow, ray flowers are fusiform and flat in disposition. The seed is ovoid elongated and dark brown with

4. This variety is resistant to tribenuron-methyl herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY

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Sunflower

7PLVK55B

1. 7PLVK55B is a linoleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross T0916LG/T0605LG/U0761LG. T0916LG, T0605LG/U0761LG are Pioneer proprietary lines. Selections were made for shorter plant stature, earlier flowering, oil content and yield, as assessed in hybrid combination. The pedigree method was used in the development of 7PLVK55B. It is a bulk of F8 seed tracing back to a single F7 selection. The sterile analog derives from the CMS PET1 cytoplasm following 4 generations of backcrossing. It is homozygous dominant for single head.

2. Hybrids utilizing 7PLVK55B have been tested and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. **Flowering (relatively early, medium, or late?):** late  
   **Height (relatively short, medium or tall?):** very tall  
   **Branching Type:** absent  
   **Distal Leaf Shape:** broad triangular to acuminate  
   **Leaf Serration:** coarse  
   **Leaf Attitude:** medium  
   **Leaf Blistering:** medium  
   **Leaf Color:** medium green  
   **Ray Flower Color:** medium yellow  
   **Ray Flowers:** medium density, fusiform  
   **Stigma Anthocyanin:** absent  
   **Flat, medium length**  
   **Pappi Color:** green  
   **Disk Flower Color:** orange  
   **Head (neck) Attitude:** half-turned down with straight stem  
   **Pollen Color:** yellow  
   **Seed Shape:** oval wide  
   **Head Shape:** strongly convex  
   **Seed Thickness:** medium  
   **Seed Outer Pericarp Color:** black  
   **Hypocotyl Anthocyanin:** present, strong  
   **Stripe Appearance:** marginal: strongly expressed center: weakly expressed color: grey

**State expected variants or other varietal information not described above (if none, state “none”)**

7PLVK55B is a linoleic maintainer line. Compared to the public line HA89, 7PLVK55B blooms later (6 days) and is taller. The strongly concave leaves are broad triangular to acuminate. Head attitude is half-turned down with straight stem. The seed is black with grey stripes both on and in between the margins.

4. This variety claims no resistance to the common sunflower diseases and insect pests.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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**7PQZC62B**

1. **7PQZC62B** is an oleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross T0833HG/PH1015B. T0833HG & PH1015B are all Pioneer proprietary lines. Selections were made for earlier flowering, shorter plant height, oil & fatty acid content and yield, as assessed in hybrid combination.

   The pedigree method was used in the development of **7PQZC62B**. It is a bulk of F8 seed tracing back to a single F7 selection. The sterile analog derives from the CMS PET1 cytoplasm following 4 generations of backcrossing. It is homozygous dominant for single heads.

2. Hybrids utilizing **7PQZC62B** have been tested in and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. **Flowering (relatively early, medium, or late?):** late  
   **Height (relatively short, medium or tall?):** short  
   **Branching Type:** absent  
   **Distal Leaf Shape:** lanceolate to narrow triangular  
   **Leaf Serration:** isolated or very fine  
   **Leaf Attitude:** medium  
   **Leaf Blistering:** medium  
   **Leaf Color:** dark green  
   **Ray Flower Color:** medium yellow  
   **Ray Flowers:** medium density, fusiform  
   **Stigma Anthocyanin:** absent  
   **Longitudinal recurved, medium length:**  
   **Pappi Color:** green  
   **Disk Flower Color:** orange  
   **Head (neck) Attitude:** half-turned down with straight stem  
   **Pollen Color:** yellow  
   **Seed Shape:** ovoid elongated  
   **Head Shape:** weakly convex  
   **Seed Thickness:** thin  
   **Seed Outer Pericarp Color:** dark brown  
   **Hypocotyl Anthocyanin:** present, weak  
   **Stripe Appearance:** marginal: weakly expressed center; weakly expressed color: grey

**State expected variants or other varietal information not described above (if none, state “none”):**

**7PQZC62B** is an oleic oil type maintainer line. Compared to the public line HAB89, **7PQZC62B** blooms later and is slightly shorter. The leaves are triangular narrow to lanceolate and the leaf wings are strongly expressed. The involucral bracts are dark green. The seed is ovoid elongated and is dark brown with grey marginal and in between stripes. Hypocotyl anthocyanin is

4. **This variety claims no resistance to the common sunflower diseases and insect pests.**

5. **Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.**

6. **Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.**

7. **Application for protection under the Plant Variety Protection Act will not be made.**

**INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY**

Date this application was submitted: ___________________ Date recommended by the VRB: ___________________
1. **7PTKP67B** is a tribenuron-methyl resistant, high oleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the backcross PH1023B/T916L.G. PH1023B & T916L.G are Pioneer proprietary lines. PH1023B is a tribenuron-methyl resistant, high oleic oil type line used as the donor for herbicide resistance and oleic oil type. Selections were made for tribenuron-methyl resistance, fatty acid content, and yield, as assessed in hybrid combination.
   The pedigree method was used in the development of 7PTKP67B. It is a bulk of F6 seed tracing back to a single F5 selection. The sterile analog derives from the CMS PET1 cytoplasm following 5 generations of backcrossing. It is homozygous dominant for single head.

2. Hybrids utilizing 7PTKP67B have been tested and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): **early**
   Height (relatively short, medium or tall?): **medium**
   Branching Type: **absent**
   Distal Leaf Shape: **narrow triangular to broad triangular**
   Leaf Serration: **fine**
   Leaf Attitude: **low**
   Leaf Blistering: **medium**
   Leaf Color: **medium green**
   Ray Flower Color: **medium yellow**
   Ray Flowers: **dense, fusiform**
   Stigma Anthocyanin: **absent**
   Pappi Color: **green**
   Disk Flower Color: **orange**
   Head (neck) Attitude: **half-turned down with straight stem**
   Pollen Color: **yellow**
   Seed Shape: **avoid wide**
   Head Shape: **weakly convex**
   Seed Thickness: **thin**
   Seed Outer Pericarp Color: **black**
   Hypocotyl Anthocyanin: **present, medium**
   Stripe Appearance: **marginal: strongly expressed center: weakly expressed color: grey**

4. State expected variants or other varietal information not described above (if none, state “none”).
   7PTKP67B is a high oleic type, tribenuron-methyl resistant maintainer line. Compared to the public line HA89, 7PTKP67B blooms earlier (1 days) and is similar height. The leaves serration is fine and the ray flower shape is fusiform. Bract shape is rounded and strongly embracing.

5. The variety is resistant to tribenuron-methyl herbicide.

6. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

7. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

**APPLICATION FOR PROTECTION UNDER THE PLANT VARIETY PROTECTION ACT WILL NOT BE MADE.**

**INFORMATION BELOW FOR AOSCA INTERNAL USE ONLY**

Date this application was submitted: ____________________________ Date recommended by the VRB: ____________________________
Sunflower
7PURJ07R

7PURJ07R is a linoleic oil type restorer line developed by Pioneer Hi-Bred International that derives from the cross D0250L.M*2/PH5016R. D0250L.M & PH5016R are all Pioneer proprietary lines. Selections were made for Recurrent parent trait, oil content and yield, as assessed in hybrid combination.

The pedigree method was used in the development of 7PURJ07R. It is a bulk of BC1F4 seed tracing back to a single BC1F3 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

Hybrids utilizing 7PURJ07R have been tested and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

Flowering (relatively early, medium, or late?): late
Height (relatively short, medium or tall?): very short
Branching Type: present, overall
Distal Leaf Shape: narrow triangular to broad triangular
Leaf Serration: medium
Leaf Attitude: low
Leaf Blistering: medium
Leaf Color: medium green
Ray Flower Color: medium yellow
Ray Flowers: dense, narrow ovate
Stigma Anthocyanin: absent
Flat, medium length
Pappi Color: rust
Disk Flower Color: orange
Head (neck) Attitude: inclined
Pollen Color: yellow
Seed Shape: ovoid elongated
Head Shape: flat
Seed Thickness: thin
Seed Outer Pericarp Color: black
Hypocotyl Anthocyanin: present, weak
Stripe Appearance: marginal: weakly expressed center: weakly expressed color: grey

State expected variants or other varietal information not described above (if none, state “none”)
7PURJ07R is a linoleic type restorer line. Compared to the public line RH4274, 7PURJ07R is slightly later and smaller. Leaves serration is medium and leaf auricles are small. The anthocyanin coloration of stigma is absent. The type of branching is predominantly overall and head attitude is inclined. The seeds are black with weak grey stripes on margin and between

7PURJ07R claims no resistance to the common sunflower diseases and insect pests.

Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

Certified seed is first expected to be available in 2020. please do not publish certified seed production acreage.

Application for protection under the Plant Variety Protection Act will not be made.

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Sunflower

7PXDV38R

1. 7PXDV38R is a tribenuron-methyl resistant, linoleic oil type restorer line developed by Pioneer Hi-Bred International that derives from the cross PH6000R/X0008LM. PH6000R and X0008LM are Pioneer proprietary lines. PH6000R is a tribenuron-methyl resistant line used as the donor for herbicide resistance. Selections were made for tribenuron-methyl resistance, earlier flowering, shorter plant height, oil content and yield, as assessed in hybrid combination. The pedigree method was used in the development of 7PXDV38R. It is a bulk of F6 seed tracing back to a single F5 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

2. Hybrids utilizing 7PXDV38R have been tested and are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): late
   Height (relatively short, medium or tall?): short
   Branching Type: present, overall
   Distal Leaf Shape: broad triangular to rounded
   Leaf Attitude: medium
   Leaf Color: medium green
   Ray Flowers: medium density, narrow ovate
   Flat, medium length
   Disk Flower Color: orange
   Head (neck) Attitude: half-turned down with straight stem
   Pollen Color: yellow
   Head Shape: strongly convex
   Seed Outer Pericarp Color: medium brown
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal: none or weakly expressed center: none or weakly expressed color

State expected variants or other varietal information not described above (if none, state “none”)

7PXDV38R is a linoleic type, tribenuron-methyl resistant restorer line. Compared to the public line RH4274, 7PXDV38R is slightly shorter and blooms eight day later. Anthocyanin coloration of stigma is absent. The type of branching is predominantly overall. Head attitude is half-turned down with straight stem and head shape of grain side is strongly convex. Main seed color is

4. This variety is resistant to tribenuron-methyl herbicide.

5. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

6. Certified seed is first expected to be available in 2020. please do not publish certified seed production acreage.

7. Application for protection under the Plant Variety Protection Act will not be made.

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7PYSM91B

1. 7PYSM91B is a linoleic oil type, tribenuron-methyl resistant maintainer line developed by Pioneer Hi-Bred International that derives from the cross U0954L/G1255SULG. Both U0954L/G1255SULG are all Pioneer proprietary lines. U1255SULG is a tribenuron-methyl resistant line used as the donor for herbicide resistance. Selections were made for tribenuron-methyl resistance, earlier flowering, shorter plant height, oil content and yield, as assessed in hybrid combination.

The pedigree method was used in the development of 7PYSM91B. It is a bulk of F8 seed tracing back to a single F7 selection. The sterile analog derives from the CMS PET1 cytoplasm following 6 generations of backcrossing. It is homozygous dominant for single head.

2. Hybrids utilizing 7PYSM91B have been tested in and are adapted to the growing regions of the Central, Eastern, and Western Europe.

3. Flowering (relatively early, medium, or late?): medium
   Height (relatively short, medium, or tall?): medium
   Branching Type: __absent__,
   Distal Leaf Shape: broad triangular to rounded
   Leaf Serration: medium
   Leaf Attitude: high
   Leaf Blistering: weak
   Leaf Color: medium green
   Ray Flower Color: medium yellow
   Ray Flowers: sparse, fusiform
   Stigma Anthocyanin: absent
   Pappi Color: green
   Flat, medium length
   Disk Flower Color: yellow
   Head (neck) Attitude: turned down with straight stem
   Pollen Color: yellow
   Seed Shape: ovoid elongated
   Seed Thickness: medium
   Seed Outer Pericarp Color: black
   Hypocotyl Anthocyanin: absent
   Stripe Appearance: marginal: weakly expressed center: weakly expressed color: grey

State expected variants or other varieties information not described above (if none, state "none")

4. 7PYSM91B is a linoleic oil type, tribenuron-methyl resistant maintainer line. Compared to the public line HA89, 7PYSM91B blooms similarly and is slightly shorter. The broad triangular to rounded leaves are smaller than HA89. The fusiform, yellow ray flowers are similar to HA89. The yellow disk flower is yellow. The seed is ovoid elongated. 7PYSM91B has seed that are black.

5. This variety is resistant to tribenuron-methyl herbicide.

6. Pioneer Hi-Bred International will be responsible for the maintenance of all seed stocks. Foundation seed will be produced in open pollinated field increases in isolation as prescribed by the state where the seed is grown. A maximum of two generations beyond breeder seed will be allowed. Breeder seed will originate from cage isolations or, on occasion, from controlled bagging in nursery rows.

7. Certified seed is first expected to be available in 2020. Please do not publish certified seed production acreage.

APPLICATION FOR PROTECTION UNDER THE PLANT VARIETY PROTECTION ACT WILL NOT BE MADE.

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