

**A REPORT OF THE  
NATIONAL SUNFLOWER VARIETY REVIEW BOARD**



**ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES**

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ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES  
(April 2010)

The Association of Official Seed Certifying Agencies (AOSCA) National Sunflower Variety Review Board (NSFVRB), reviewed the following varieties on April 22, 2010, in Fargo, North Dakota. 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 National Sunflower Variety Review Board by the applicants. The National Sunflower Variety Review Board makes judgment regarding recommendation of varieties for inclusion in certification based on the data supplied. Beyond this, the National 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 National Sunflower Variety Review Board can be obtained from:

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Respectfully submitted,

Ron Larson, Chairman  
National Sunflower Variety Review Board

**2010 AOSCA SUNFLOWER NVRB  
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## 25047

1. 25047 is a high-oleic, downy-mildew (race 730) resistant B line developed by Advanta US, Inc. from a cross of two high-oleic Advanta proprietary B lines: 25017/20341. 25017 carries Pl6 downy-mildew resistance gene. Pedigree method was followed along with selection for good agronomics, attractive phenotype, oil content, high-oleic percentage, and PET1 sterility maintenance. The general and specific combining ability was tested in F4 and F5, respectively. 25047 is the B line of the female 15047 (CMS PET1). Subsequent selections were performed for oil content, oleic percentage, plant uniformity and downy-mildew (race 730) resistance. A single F10 selected plant was selfed to produce the first breeder seed of 25047. A single BC5 plant was selected and crossed with the B line to produce the first breeder seed of 15047.
2. 25047 and its hybrids are considered mid-early or of medium maturity, so adapted to mid season sunflower growing areas of the U.S., especially of N. Dakota Minnesota and S. Dakota, where they were tested 3 years. The primary uses of the hybrids produced with 25047 are mid-oleic (Nusun) and high-oleic oils.
3. Maturity (relatively early, medium or late?): medium  
Height (relatively short, medium or tall?): medium  
Stem branching: no branching  
Leaf shape: cordate Leaf margins: finely serrate  
Leaf attitude: horizontal Leaf surface: smooth  
Leaf color: green  
Ray flowers: present Ray flower color: yellow  
Disk flower color: yellow Stigma anthocyanin: absent  
Pollen color: yellow Pappi color: green  
Receptacle shape: convex Head (neck) attitude: ascending  
Seed outer pericarp color: Dark gray Seed middle pericarp color: white  
Stripe appearance: Marginal, light-gray Seed shape: Narrowly ovate  
Seed cross-section: curved

State expected variants or other varietal traits that will assist in identification in the field:

Very uniform in blooming and all the other traits; medium plant height; very good lodging and broken neck resistance; the head is large, convex and ascending at maturity; seeds are dark gray with narrow light-gray marginal stripes, narrowly ovate and long.

4. 25047 is resistant to downy mildew (races 730) and Phomopsis.
5. Advanta Pacific, LLC is fully responsible for the respective sunflower inbred line maintenance and multiplication, preserving its genetic purity identity and seed quality. The multiplication procedure comprises 3 generations (stages): 1. Breeder seed (produced under bags - direct Sunflower Breeder supervision), and 2. Foundation, and Basic seed is produced under cages or in isolated plots.
6. If 25047 is accepted by official certifying agencies, certified seed will be first offered for sale in 2010. Advanta US, Inc. does not want the acreage certified each year to be published by AOSCA and the certifying agencies.
7. For present, application will not be made for P.V.P.



## 35059

1. 35059 is an oil (traditional) type sunflower restorer inbred line, developed by Advanta US, Inc. It was derived from the cross of two Advanta restorer lines: 35041 / 35034. The line 35041 is total resistant to downy-mildew (race 730), and very resistant to Phomopsis, and stalk lodging. 35034 is a line with excellent general combining ability. Pedigree method was followed, along with selection for pollen fertility restoration, high oil content, and desired agronomics. Subsequent selections were performed for oil content, shorter plant height, uniformity and downy-mildew (race 730) resistance. This line is a recessive branched restorer, homozygous for the Rf1 gene in PET1 sterile cytoplasm. A single F6 selected plant was selfed to produce the first breeder seed of 35059.
2. 35059 and its hybrids are considered medium early, so adapted to mid season sunflower growing areas of the U.S., especially of N. Dakota, Minnesota and S. Dakota, where they were tested 3 years. The primary uses of the hybrids produced with 35059 are traditional high linoleic and mid-oleic (Nusun) oils.
3. Maturity (relatively early, medium or late?): medium-early  
Height (relatively short, medium or tall?): short  
Stem branching: fully branched  
Leaf shape: narrow triangular to broad triangular Leaf margins: medium serrate  
Leaf attitude: ascending Leaf surface: medium crinkled  
Leaf color: green  
Ray flowers: present Ray flower color: yellow  
Disk flower color: yellow Stigma anthocyanin: absent  
Pollen color: yellow Pappi color: green  
Receptacle shape: convex Head (neck) attitude: ascending  
Seed outer pericarp color: brown Seed middle pericarp color: white  
Stripe appearance: absent Seed shape: broadly ovate  
Seed cross-section: curved

State expected variants or other varietal traits that will assist in identification in the field:

Very uniform in blooming and all the other traits; short plant height; very good lodging and broken neck resistance; the main head is convex and ascending at maturity; seeds are brown without stripes, and broadly ovate.

4. 35059 is resistant to downy mildew (races 730) and Phomopsis.
5. Advanta Pacific, LLC is fully responsible for the respective sunflower inbred line maintenance and multiplication, preserving its genetic purity identity and seed quality. The multiplication procedure comprises 3 generations (stages): 1. Breeder seed (produced under bags - direct Sunflower Breeder supervision), and 2. Foundation, and Basic seed is produced under cages or in isolated plots.
6. If 35059 is accepted by official certifying agencies, certified seed will be first offered for sale in 2010. Advanta US, Inc. does not want the acreage certified each year to be published by AOSCA and the certifying agencies.
7. For present, application will not be made for P.V.P.



## 35061

1. 35061 is an Advanta imidazolinone (IMI) tolerant sunflower restorer line. It was developed from a cross between IMISUN-2 and the Advanta restorer line R226. IMISUN-2 is a public line released by USDA as IMI tolerance source. R226 is an early, very short oil (traditional) type restorer with a very good general combining ability. Pedigree method was followed along with selection for IMI tolerance, very good agronomics, attractive phenotype, oil content, and Phomopsis resistance. A single BC1F5 selected plant was selfed to produce the first Breeder seed of 35061. This line is a recessive top branched with central head restorer, homozygous for the Rfl gene in Pet 1 cytoplasm. Subsequent selections were performed for short plant height, earliness, lodging and Phomopsis resistance, as well as for total IMI tolerance
2. 35061 and its hybrids are considered medium early, so adapted to mid season sunflower growing areas of the U.S., especially of N. Dakota, Minnesota and S. Dakota, where they were tested 3 years. They are recommended especially for areas with high weed infestation. The primary uses of the hybrids produced with 35059 are traditional high linoleic and mid-oleic (Nusun) oils.
3. Maturity (relatively early, medium or late?): medium-early  
Height (relatively short, medium or tall?): medium  
Stem branching: top branched  
Leaf shape: narrow triangular to broad triangular Leaf margins: medium serrate  
Leaf attitude: ascending Leaf surface: medium crinkled  
Leaf color: green  
Ray flowers: present Ray flower color: yellow  
Disk flower color: yellow Stigma anthocyanin: absent  
Pollen color: yellow Pappi color: green  
Receptacle shape: convex Head (neck) attitude: ascending  
Seed outer pericarp color: nearly solid black Seed middle pericarp color: white  
Stripe appearance: absent Seed shape: broadly ovate  
Seed cross-section: curved

State expected variants or other varietal traits that will assist in identification in the field:

Very uniform in blooming and all the other traits; medium plant height; excellent lodging and broken neck resistance; the main head is convex and ascending at maturity; seeds are black without stripes, and broadly ovate.

4. 35061 is tolerant to imazamox (IMI herbicide), and resistant to Phomopsis.
5. Advanta Pacific, LLC is fully responsible for the respective sunflower inbred line maintenance and multiplication, preserving its genetic purity identity and seed quality. The multiplication procedure comprises 3 generations (stages): 1. Breeder seed (produced under bags - direct Sunflower Breeder supervision), and 2. Foundation, and Basic seed is produced under cages or in isolated plots.
6. If 35061 is accepted by official certifying agencies, certified seed will be first offered for sale in 2011. Advanta US, Inc. does not want the acreage certified each year to be published by AOSCA and the certifying agencies.
7. For present, application will not be made for P.V.P.



## 39809

1. 39809 is an Advanta high stearic- mid oleic\* sunflower R line (fertility restorer line), developed by Advanta Argentina (Balcarce research program) from an Advanta R-line population. This population resulted from the cross of the Advanta conventional (high linoleic) line 34307 with an Advanta high stearic- high oleic source (oleic  $\geq 60\%$  and stearic  $\geq 15\%$ ). Pedigree method was followed along with selection for good agronomics, intermediate maturity, oil content and high stearic- high oleic percentage. It is a recessive branched restorer. The general and specific combining abilities were tested in F5. The line was considered stable for all traits in the nursery of Balcarce -Buenos Aires- Argentina, season 2008/09. Harvested F6 seed represented the first Breeder seed of 39809.
2. 39809 produces medium maturity or mid-late hybrids, well adapted to mid and long sunflower growing areas of Argentina and USA. The new line and its hybrids were tested in Argentina (2007/08 and 2008/09) and in the US (2009). The primary uses of the hybrids produced with 39809 are high stearic- high oleic oils.
3. Maturity (relatively early, medium or late?): Medium to mid-late  
Height (relatively short, medium or tall?): Medium-tall  
Stem branching: Top branching with central head  
Leaf shape: Cordate Leaf margins: Medium  
Leaf attitude: Descending Leaf surface: Slightly crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Orange yellow  
Disk flower color: Yellow Stigma anthocyanin: Present weak  
Pollen color: Light Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Vertical  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Narrow dark-gray striping Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

39809 shows a predominantly top branching with central head, it is very uniform in blooming and all the other traits; plant height, with good lodging and broken neck resistance, the main head is flat and vertical at maturity, seed is striped black with narrow dark-gray striping.

4. 39809 is susceptible to Verticillium wilt (race VO94), downy mildew (race 730), and white rust (Albugo).
5. Advanta Semillas S. A. I. C. is fully responsible for the respective sunflower inbred line maintenance and multiplication, preserving its genetic purity identity and seed quality. The multiplication procedure comprises 3 generations (stages): 1. Breeder seed (produced under bags - direct Sunflower Breeder supervision), and 2. Foundation and Basic seed is produced under cages or in isolated plots.
6. If 39809 is accepted by official certifying agencies, certified seed will be first offered for sale in 2010. Advanta Semillas S. A. I. C. does not want the acreage certified each year to be published by AOSCA and the certifying agencies.
7. For present, application will not be made for P.V.P.





## 06-R190IMI

1. 06-R190IMI is imidazolinone resistant confectionery restorer line developed by CHS Inc. through pedigree selection. It is a selection from a cross of CHS 00-R180/3\*CHS00-R140. Plants were selfed 7 generations and testcrossed for a dominant gene controlling fertility restoration of PET 1 male-sterile cytoplasm. Achene and imazamox herbicide resistant plant selections were made at each generation. F8 Testcrossed rows that were 100% fertile were bulked. Hybrid testing began at the F6 generation.
2. 06-R190IMI has been extensively tested in the main production areas of North Dakota. Its primary use will be as a parent line in hybrids that are bred for the confectionery sunflower industry of the United States.
3. Maturity (relatively early, medium or late?): Late  
Height (relatively short, medium or tall?): Relatively tall  
Stem branching: Top Stem Branching  
Leaf shape: Cordate Leaf margins: Medium serrate  
Leaf attitude: Horizontal Leaf surface: Lightly Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Ascending  
Seed outer pericarp color: Dark Brown Seed middle pericarp color: White  
Stripe appearance: Marginal Seed shape: Narrowly ovate  
Seed cross-section: Not-Curved

State expected variants or other varietal traits that will assist in identification in the field: None evident

4. 06-R190IMI is resistant to imidazolinone herbicides.
5. Stock seed will be maintained by CHS Inc. exclusively. Seed will be increased from pollinations under bag or cage. Individual heads are test crossed to CMS to check for fertility restoration. These rows that show 100% fertility restoration are bulked and planted to cage or bag increase. Breeder seed will then go into the foundation increase to be used in hybrid seed production. Foundation seed will be limited to 2 generations past breeder seed level.
6. Certified seed of hybrids using this variety may be made available for the 2010 season. Please do not publish certified acreage.
7. It is not anticipated that PVP application will be made on this variety.



## CN7494R

1. CN7494R is a linoleic oilseed restorer line developed by Mycogen Seed Co. derived from the cross U9247R/291162R. U9247R and 291162R are Mycogen proprietary inbred R-lines. The pedigree method was used in the development of CN7494R. It is derived from a bulk of seed from F7 plants tracing back to a single F6 plant. CN7494R has the Cms PET 1 [*H. petiolaris* (French)] cytoplasm and is homozygous for fertility restoration, confirmed by male flower fertility. Selection criteria includes improved hybrid seed and oil yield in hybrid crosses relative to Mycogen Seed's proprietary hybrid checks.
2. CN7494R hybrids are adapted for oilseed markets in the northern and southern plains of the U.S.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Descending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Present  
Pollen color: Yellow Pappi color: Rust  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Nearly solid black Seed middle pericarp color: White  
Stripe appearance: Narrow dark-gray stripes Seed shape: Narrowly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field:

CN7494R is a fully branched linoleic restorer line. It has medium short height approximately 18 cm less than RHA274. Anthocyanin is expressed in the stigmas and pappi as RHA274, but expression in pappi is weaker than RHA274. CN7494R has shorter internodes and more leaves than RHA274, giving its leaf canopy a more full/dense appearance. Head attitude is descending. Seed is nearly solid black and shorter in length than RHA274.

4. CN7494R does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage.
7. It is not anticipated that a PVP application will be made on this variety.



## CN8129B

1. CN8129B is a linoleic confection maintainer developed by Mycogen Seeds that is derived from the cross 612099B/ON1153B. Both 612099B and ON1153B are Mycogen Seeds proprietary lines. The pedigree breeding method was used for the development of CN8129B. It is a bulk of F7 plants tracing back to a single F6 plant. The male-sterile component of CN8129B, named CN8129A, uses the Cms PET 1 [*H. petiolaris* (French)] cytoplasm. CN8129B was selected on seed size improvement in hybrid testcrosses relative to Mycogen proprietary checks.
2. CN8129B hybrids are adapted for confection markets in the U.S. and Argentina.

3. Maturity (relatively early, medium or late?): Medium late  
Height (relatively short, medium or tall?): tall  
Stem branching: none  
Leaf shape: Cordate Leaf margins: Medium serrate  
Leaf attitude: Decending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Decending  
Seed outer pericarp color: Striped grey Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Oblong  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field:

CN8129B days to flower and maturity are approximately 3 and 4 days later than HA292B making it a medium late maturing inbred. Plant height can be characterized as tall, about 13 cm taller than HA292B. CN8129B has a high number of leaves and shorter internode length relative to HA292B. Leaves are light green in color and noticeably large, and approximately 5 cm longer than wide. Stigma and pappi color are yellow and green with no visible presence of anthocyanin. The seed size of CN8129B is greater in length than HA292B (18mm long vs 14mm). Hull color is gray with narrow white stripes.

4. CN8129B does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage.
7. It is not anticipated that a PVP application will be made on this variety.



## OIN115B

1. OIN115B is a high oleic non-oilseed maintainer developed by Mycogen Seeds that is a backcross 4 derivation from H115B\*5/IMISUN-3XB. H115B is a Mycogen proprietary line used as the recurrent parent. IMISUN-3XB is a imidazolinone resistant donor parent released by the USDA-ARS in 1998. The backcross pedigree method was used in the development of OIN115B. It is a BC4F5 tracing back to a single BC4F4 plant. The male-sterile component of OIN115B, named OIN115A, uses the Cms PET 1 [*H. petiolaris* (French)] cytoplasm.
2. OIN115B hybrids are adapted for oilseed markets in the northern and southern plains of the U.S.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: none  
Leaf shape: Cordate Leaf margins: Medium serrate  
Leaf attitude: Descending Leaf surface: Crinkled  
Leaf color: Dark Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Even black and white stripes Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field:

OIN115B is similar in days to flower and maturity as HA292, but 2 and 3 days later than the recurrent parent H115B. It is resistant to imidazolinone herbicides. Leaves are obviously smaller and darker green than HA292. Stigmas and pappi have no anthocyanin - similar to HA292. OIN115B has a noticeably smaller seed size than HA292 – only slightly larger than most oilseeds. OIN115B has striped seed that is black with marginal and lateral white stripes. Plant height is about 13 cm taller than HA292.

4. OIN115B has genetic resistance to imidazolinone herbicides. This variety does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage.
7. It is not anticipated that a PVP application will be made on this variety.



## OIN280R

1. OIN280R is a imidazolinone resistant high oleic non-oilseed restorer line developed by Mycogen Seed Co. derived from the backcross H280R\*5/CIN081R. H280R and CIN081R are Mycogen proprietary recurrent and IMI donor inbred parents, respectively. The backcross pedigree method was used in the development of OIN280R. It is a BC4F7 tracing back to a single BC4F6 plant. OIN280R has the Cms PET 1 [*H. petiolaris* (French)] cytoplasm and is homozygous for fertility restoration, confirmed by male flower fertility. Selection criteria include conversion of H280R to imidazolinone resistance while maintaining performance in hybrid crosses.
2. OIN280R hybrids are adapted for oilseed markets in the northern plains and late plantings in the southern plains of the U.S.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Tall  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Descending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Narrow white stripes Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

OIN280R is a fully branched high oleic non-oilseed restorer line. It is approximately 12 cm taller than RHA294 making OIN280R a taller than average inbred. Leaves have average length and width, but have distinctive wavy margins. Leaf canopy appears sparse due to long midstem internodes. OIN280R white stripes are narrower than its black stripes. Seed size is longer and wider than RHA294.

4. OIN280R has genetic resistance to imidazolinone herbicides. This variety does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage.
7. It is not anticipated that a PVP application will be made on this variety.



## ON7436B

1. ON7436B is a Oleic oilseed maintainer developed by Mycogen Seeds that is derived from the cross H757B/H251B. Both H757B and H251B are Mycogen Seeds proprietary lines. The pedigree method was used in the development of ON7436B. It is a bulk of F7 plants that trace back to a single F6 plant. The male-sterile component of ON7436B, named ON7436A, uses the cms PET 1 (*H. petiolaris* (French)) cytoplasm. Selection criteria include improved hybrid seed and oil yield in hybrid crosses having similar maturity relative to Mycogen Seed's proprietary hybrid checks.
2. ON8590B hybrids are adapted for oilseed markets in the northern and southern plains of the U.S.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium Serrate  
Leaf attitude: Ascending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Present  
Pollen color: Yellow Pappi color: Red  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Nearly solid black Seed middle pericarp color: White  
Stripe appearance: Narrow dark/gray strip Seed shape: obovate  
Seed cross-section: Not-curved

State expected variants or other varietal traits that will assist in identification in the field:

ON7436B days to flower and maturity are approximately 5 and 4 days later than HA89 making it a medium maturing inbred. Plant height can be characterized as medium height, about 38 cm taller than HA89. ON7436B has seven more leaves giving it a dense canopy with a slightly longer internodes relative to HA89. Stigma anthocyanin is strongly expressed against the predominately yellow background. Pappi are rust colored. Anthocyanin is absent in the stigmas and pappi of HA89. Seed color is nearly solid black with narrow dark gray stripes.

4. ON7436B does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage
7. It is not anticipated that a PVP application will be made on this variety.



## ON8590B

1. ON8590B is a high oleic oilseed maintainer developed by Mycogen Seeds that is derived from the cross 509B/ON4404B. Both 509B and ON4404B are Mycogen Seeds proprietary lines. The pedigree breeding method was used for the development of ON8590B. It is a bulk of F7 plants tracing back to a single F6 plant. The male-sterile component of ON8590B, named ON8590A, uses the Cms PET 1 [*H. petiolaris* (French)] cytoplasm. Selection criteria include improved hybrid seed and oil yield in hybrid crosses having similar maturity relative to Mycogen Seed's proprietary hybrid checks.
2. ON8590B hybrids are adapted for oilseed markets in the northern and southern plains of the U.S.

3. Maturity (relatively early, medium or late?): Late  
Height (relatively short, medium or tall?): Short  
Stem branching: none  
Leaf shape: Cordate Leaf margins: Medium serrate  
Leaf attitude: Descending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Horizontal  
Seed outer pericarp color: Nearly solid black Seed middle pericarp color: White  
Stripe appearance: Narrow dark gray striping Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field:

ON8590B days to flower and maturity are approximately 8 and 11 days later than HA89 making it a late maturing inbred. Plant height can be characterized as medium short height, only about 10 cm taller than HA89. ON8590B has a high number of leaves giving it a dense canopy with shorter than average internodes relative to HA89. Stigma and pappi color are yellow and green with no visible presence of anthocyanin. Seed color is nearly solid black with narrow dark gray stripes.

4. ON8590B does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage.
7. It is not anticipated that a PVP application will be made on this variety.



## ON9337R

1. ON9337R is a high oleic confection restorer line developed by Mycogen Seeds derived from the cross H280R//DY3//H417R/948R. H280R, H417R, and 948R are Mycogen proprietary inbred lines. DY3 is an open-pollinated variety from Europe. The pedigree breeding method was used for the development on ON9337R. It is derived from a bulk of seed from F7 plants that trace to a single F6 plant. ON9337R has the CMS PET 1 [H. petiolaris (French)] cytoplasm and is homozygous for fertility restoration, confirmed by male flower fertility. ON9337R was selected for high oleic confection hybrid development with similar yield performance of conventional linoleic proprietary Mycogen confection checks.
2. Hybrids utilizing ON9337R are adapted to the major sunflower growing regions of North and South America, used primarily for the in-shell market.

3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top Branching  
Leaf shape: Cordate Leaf margins: Medium Serrate  
Leaf attitude: Ascending Leaf surface: Crinkled  
Leaf color: Dark Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Decending  
Seed outer pericarp color: Striped grey Seed middle pericarp color: White  
Stripe appearance: Narrow dark grey striping Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

ON9337R is a medium maturing/height restorer with upper stem branching. Leaves are average in size with noticeable darker green color than RHA294. Anthocyanin is absent from the stigmas and pappi. Ray flower petals are obviously wider than average making the flowering head appear dense with ray petals. Seed hulls are mostly gray with narrow dark gray striping.

4. ON9337R does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2012 season. Please do not publish certified acreage.
7. It is not anticipated that a PVP application will be made on this variety.





## ONN608R

1. ONN608R is an oleic oilseed restorer line developed by Mycogen Seeds that is derived from the cross C608R/H1063R. Both C608R and H1063R are Mycogen Seeds proprietary lines. The pedigree method was used in the development of ONN608R. It is a bulk of F6 plants that trace back to a single F5 plant. ONN608R has the Cms PET 1 [*H. petiolaris* (French)] cytoplasm and is homozygous for fertility restoration, confirmed by male flower fertility. Selection criteria include improved hybrid seed and oil yield in hybrid crosses having similar maturity relative to Mycogen Seed's proprietary hybrid checks.
2. ONN608 hybrids are adapted for oilseed markets in the northern and southern plains of the U.S.
3. Maturity (relatively early, medium or late?): Late  
Height (relatively short, medium or tall?): Tall  
Stem branching: Top branching w cntrl hd  
Leaf shape: Cordate Leaf margins: Medium Serrate  
Leaf attitude: Ascending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Present  
Pollen color: Yellow Pappi color: Rust  
Receptacle shape: Flat Head (neck) attitude: Descending  
Seed outer pericarp color: Nearly solid black Seed middle pericarp color: White  
Stripe appearance: Narrow dark/gray strip Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

ONN608R days to flower and maturity are approximately 14 and 15 days later than RHA274 making it a late maturing inbred. Plant height can be characterized as tall height, about 24cm taller than RHA274. ONN608R has two fewer leaves giving it a less dense canopy with longer internodes relative to RHA274. Stigmas show presence of anthocyanin and pappi are rust colored. Seed color is nearly solid black with narrow dark gray stripes.

4. ONN608R does not appear to have obvious qualitative genetic resistance to major diseases and insects.
5. Mycogen Seed Co. is responsible for maintenance of all seed stocks. Foundation seed will be produced in open-pollinated increases in isolation according to standards in the state where it is produced. A maximum of two generations beyond breeder seed will be permitted. Breeder seed will originate from cage isolations or controlled bagging in a nursery. No licensing agreements are anticipated.
6. Certified seed of hybrids using this variety may be made available for the 2011 season. Please do not publish certified acreage
7. It is not anticipated that a PVP application will be made on this variety.



## B0502LG

1. B0502LG is an Express resistant, linoleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross PK68G\*4/SU7G. PK68G and SU7G are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of B0502LG. It is a bulk of BC3F6 seed tracing back to a single BC3F5 selection. The sterile analog derives from the CMS PET1 cytoplasm following 5 generations of backcrossing. It is homozygous dominant for single heads.
2. Hybrids utilizing B0502LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Horizontal Leaf surface: Slight blistering  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Broadly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. B0502LG is resistant to tribenuron-methyl.
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 2010. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## B0508HM

1. B0508HM is an oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross D0030QM\*2/B0336HM. D0030QM and B0336HM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of B0508HM. It is a bulk of F5 seed tracing back to a single F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing B0508HM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top-branching  
Leaf shape: Cordate Leaf margins: Fine serration  
Leaf attitude: Horizontal Leaf surface: Smooth  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Weak presence  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Descending slightly  
Seed outer pericarp color: Dark Brown Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. B0508HM is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## F05BMLM

1. F05BMLM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross PI369359/PHA107. PHA107 is a Pioneer proprietary line. PI369359 is a USDA GRIN accession from the HOPI Indian reservation in Arizona. Selections were made for oil content, self fertility, shorter plant stature and yield, as assessed in hybrid combinations. The pedigree method was used in the development of F05BMLM. 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 F05BMLM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top-branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Ascending Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Descending slightly  
Seed outer pericarp color: Striped Black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## H02507LM

1. H02507LM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross D964NQM/T9654LM. D964NQM and T9654LM are both Pioneer proprietary lines. Selections were made for oil content, shorter plant stature, earlier flowering maturity and yield, as assessed in hybrid combinations. The pedigree method was used in the development of H02507LM. 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 H02507LM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Short  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Horizontal Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Weak  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Solid dark brown Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH1015B

1. PH1015B is an Express resistant, linoleic oil type, maintainer line developed by Pioneer Hi-Bred International that derives from the cross T0511LG//5\*[U0572LG/B0648LG]. T0511LG, U0572LG and B0648LG are all Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH1015B. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. The sterile analog derives from the CMS PET1 cytoplasm following 6 generations of backcrossing. It is homozygous dominant for single heads.
2. Hybrids utilizing PH1015B are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Ascending Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Slightly Convex Head (neck) attitude: Descending slightly  
Seed outer pericarp color: Striped Black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. PH1015B is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH1016B

1. PH1016B is an Express resistant, linoleic oil type, maintainer line developed by Pioneer Hi-Bred International that derives from the cross T9933LG\*5/B0529LG. T9933LG and B0529LG are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH1016B. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. The sterile analog derives from the CMS PET1 cytoplasm following 6 generations of backcrossing. It is homozygous dominant for single heads.
2. Hybrids utilizing PH1016B are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium, shallow serrations  
Leaf attitude: Descending Leaf surface: Medium blistering  
Leaf color: Light green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Slightly Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. PH1016B is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH1018B

1. PH1018B is an Express resistant, linoleic oil type, maintainer line developed by Pioneer Hi-Bred International that derives from the cross T9933LG\*3/HR19171051. T9933LG and HR19171051 are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH1018B. It is a bulk of BC2F5 seed tracing back to a single BC2F4 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 PH1018B are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Ascending Leaf surface: Weak blistering  
Leaf color: Light green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Slightly convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a strong intensity of hypocotyl anthocyanin.

4. PH1018B is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.





## PH1019B

1. PH1019B is an Express resistant, linoleic oil type, maintainer line developed by Pioneer Hi-Bred International that derives from the cross U0353LG\*6/B0503HG. U0353LG and B0503HG are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH1019B. It is a bulk of BC5F7 seed tracing back to a single BC5F6 selection. The sterile analog derives from the CMS PET1 cytoplasm following 8 generations of backcrossing. It is homozygous dominant for single heads.
2. Hybrids utilizing PH1019B are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Descending Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. PH1019B is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5015R

1. PH5015R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross D0250LM\*4/B0644LM. D0250LM and B0644LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5015R. It is a bulk of BC3F6 seed tracing back to a single BC3F5 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5015R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Horizontal Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Vertical  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5015R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5016R

1. PH5016R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross D0250LM\*5/B0644LM. D0250LM and B0644LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5016R. It is a bulk of BC4F4 seed tracing back to a single BC4F3 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5016R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Horizontal Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Descending slightly  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5016R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5017R

1. PH5017R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross H0555LM\*5/B0644LM. H0555LM and B0644LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5016R. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5017R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Late  
Height (relatively short, medium or tall?): Tall  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Ascending Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Slightly convex Head (neck) attitude: Descending  
Seed outer pericarp color: Solid light brown Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5017R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5020R

1. PH5020R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross U02S5LM\*5/B0642LM. U02S5LM and B0642LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5020R. It is a bulk of BC4F6 seed tracing back to a single BC4F5 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5020R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Descending Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Faint brown Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5020R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5021R

1. PH5021R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross F0318LM\*5/B0644LM. F0318LM and B0644LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5016R. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5021R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Ascending Leaf surface: Medium blistering  
Leaf color: Light Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. PH5021R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5023R

1. PH5023R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross T0267LM\*5/B0644LM. T0267LM and B0644LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5023R. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5023R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Tall  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Ascending Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Concave Head (neck) attitude: Descending  
Seed outer pericarp color: Solid brown Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5023R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5030R

1. PH5030R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross U9849LM\*5/B0642LM. U9849LM and B0642LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5030R. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5030R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Coarse serrations  
Leaf attitude: Ascending Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Solid Black Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a medium intensity of hypocotyl anthocyanin.

4. PH5030R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.





## PH5031R

1. PH5031R is an Express resistant, linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross T0267LM\*5/B0644LM. T0267LM and B0644LM are both Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5031R. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5031R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Tall  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Ascending Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Concave Head (neck) attitude: Descending  
Seed outer pericarp color: Brown Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Broadly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5031R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH5101R

1. PH5101R is an Express resistant, oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross T00B3HM/\*5[B0652HM/B0641HM]. T00B3HM, B0652HM and B0641HM are all Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH5101R. It is a bulk of BC4F7 seed tracing back to a single BC4F6 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH5101R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Finely serrated  
Leaf attitude: Horizontal Leaf surface: Strong blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex and distorted Head (neck) attitude: Slightly descending  
Seed outer pericarp color: Striped Black Seed middle pericarp color: White  
Stripe appearance: Brown, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH5101R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## PH6000R

1. PH6000R is an Express resistant, oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross LSW022QM//\*3[B0652HM/B0338HM]. LSW022QM, B0652HM and B0338HM are all Pioneer proprietary lines. Selections were made for Express resistance and recurrent parent traits. The backcross and pedigree methods were used in the development of PH6000R. It is a bulk of BC2F6 seed tracing back to a single BC2F5 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing PH6000R are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Ascending Leaf surface: Slight blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Weak presence  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Slightly descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Elliptic  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. PH6000R is resistant to tribenuron-methyl.
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0243HG

1. T0243HG is an oleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross U9605LG/VK820G. U9605LG and VK820G are both Pioneer proprietary lines. Selections were made for oleic content, earlier flowering, shorter stature, and yield, as assessed in hybrid combination. The pedigree method was used in the development of T0243HG. It is a bulk of F7 seed tracing back to a single F6 selection. The sterile analog derives from the CMS PET1 cytoplasm following 5 generations of backcrossing. It is homozygous dominant for single heads.
2. Hybrids utilizing T0243HG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Horizontal Leaf surface: Medium blistering  
Leaf color: Light green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a medium strength hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0420LG

1. T0420LG is a linoleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross T9683LG/U9605LG. T9683LG and U9605LG are both Pioneer proprietary lines. Selections were made for earlier flowering, shorter stature and yield, as assessed in hybrid combination. The pedigree method was used in the development of T0420LG. It is a bulk of F5 seed tracing back to a single F4 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 T0420LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium and deep serrations  
Leaf attitude: Horizontal Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and fusiforme and undulating Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped Black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0455LM

1. T0455LM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross PHA232//CMSHA89/H.ANN-H6. PHA232 is a Pioneer proprietary line. CMSHA89 is a USDA released sterile female. H.ANN-H6 is a wild H. annuus selection made by Pioneer in the hills of Yolo county, California. Selections were made for oil content, self fertility, recessive branching, shorter plant stature and yield, as assessed in hybrid combination. The pedigree method was used in the development of T0455LM. 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 T0455LM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium and deep serrations  
Leaf attitude: Descending Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Concave and contorted Head (neck) attitude: Descending  
Seed outer pericarp color: Brown Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0709LG

1. T0709LG is a linoleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross T00D3HG/FXT027LG. T00D3HG and FXT027LG are both Pioneer proprietary lines. Selections were made for oil content, shorter plant stature, earlier flowering, P16 gene, and yield, as assessed in hybrid combination. The pedigree method was used in the development of T0709LG. It is a bulk of F7 seed tracing back to a single F6 selection. The sterile analog derives from the CMS PET1 cytoplasm following 5 generations of backcrossing. It is homozygous dominant for single heads.
  
2. Hybrids utilizing T0709LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
  
3. Maturity (relatively early, medium or late?): Early  
 Height (relatively short, medium or tall?): Medium  
 Stem branching: None  
 Leaf shape: Cordate Leaf margins: Fine serrations  
 Leaf attitude: Ascending Leaf surface: Weak blistering  
 Leaf color: Green  
 Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
 Disk flower color: Yellow Stigma anthocyanin: Weak  
 Pollen color: Yellow Pappi color: Green  
 Receptacle shape: Convex Head (neck) attitude: Descending  
 Seed outer pericarp color: Striped black Seed middle pericarp color: White  
 Stripe appearance: Grey, both marginal and lateral Seed shape: Oblong  
 Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has weak intensity hypocotyl anthocyanin.

4. None
  
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 2011. Please do not publish certified seed production acreage.
  
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0757LM

1. T0757LM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross PHA232\*5/RHA340. PHA232 is a Pioneer proprietary line. RHA340 is a USDA released restorer line. Selections were made for the P18 gene and recurrent parent traits. The backcross and pedigree methods were used in the development of T0757LM. It is a bulk of BC4F5 seed tracing back to a single BC4F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing T0757LM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Ascending Leaf surface: Weak blistering  
Leaf color: Light green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped brown Seed middle pericarp color: White  
Stripe appearance: White, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.





## T0788HM

1. T0788HM is an oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross T00A3HM//T00A3HM/RHA340. T00A3HM is a Pioneer proprietary line. RHA340 is a USDA released restorer line. Selections were made for oleic content, the P18 gene and yield, as assessed in hybrid combinations. The pedigree method was used in the development of T0788HM. 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 T0788HM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Horizontal Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Weak intensity  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Concave and contorted Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Brown Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0795HM

1. T0795HM is an oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross T00B8HM/T00A6HM. T00B8HM and T00A6HM are both Pioneer proprietary line. Selections were made for earlier flowering and yield, as assessed in hybrid combinations. The pedigree method was used in the development of T0795HM. 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 T0795HM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Medium  
Stem branching: Top branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Horizontal Leaf surface: Medium blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a weak intensity of hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0799HM

1. T0799HM is an oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross W9721QM/T00B8HM. W9721QM and T00B8HM are both Pioneer proprietary line. Selections were made for oil content, stay green quality and yield, as assessed in hybrid combinations. The pedigree method was used in the development of T0799HM. 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 T0799HM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Late  
Height (relatively short, medium or tall?): Tall  
Stem branching: Top branching  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Horizontal Leaf surface: Heavy blistering  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## T0805LG

1. T0805LG is a linoleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross S9801LG/T9933LG. S9801LG and T9933LG are both Pioneer proprietary lines. Selections were made for earlier flowering, the Pl6 gene and yield, as assessed in hybrid combinations. The pedigree method was used in the development of T0805LG. 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 heads.
2. Hybrids utilizing T0805LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Tall  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Coarse and deep serrations  
Leaf attitude: Horizontal Leaf surface: Strong blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Brown, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## U0761LG

1. U0761LG is a linoleic oil type maintainer line developed by Pioneer Hi-Bred International that derives from the cross T0001LG//2603B/U0151LG. T0001LG and U0151LG are both Pioneer proprietary lines. 2603B is a line developed by INRA in Montpellier France and licensed for use by Pioneer. Selections were made for seed striping, the P16 gene and yield, as assessed in hybrid combinations. The pedigree method was used in the development of U0761LG. 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 heads.
2. Hybrids utilizing U0761LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Tall  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Coarse serrations  
Leaf attitude: Descending Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## U09KJLM

1. U09KJLM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross U06TJLM/U05SILM. U06TJLM and U05SILM are both Pioneer proprietary lines. Selections were made for oil content, earlier flowering, self fertility and yield, as assessed in hybrid combinations. The pedigree method was used in the development of U09KJLM. It is a bulk of F5 seed tracing back to a single F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing U09KJLM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Short  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Fine serrations  
Leaf attitude: Horizontal Leaf surface: Smooth  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Slightly descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has medium strength hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## U09LJLM

1. U09LJLM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross U02S6LM/U05SILM. U02S6LM and U05SILM are both Pioneer proprietary lines. Selections were made for oil content, earlier flowering, shorter plant stature, self fertility and yield, as assessed in hybrid combinations. The pedigree method was used in the development of U09LJLM. It is a bulk of F5 seed tracing back to a single F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing U09LJLM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Short  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Ascending Leaf surface: Smooth  
Leaf color: Green  
Ray flowers: Broadly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Vertical  
Seed outer pericarp color: Solid black Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a strong intensity of hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## U09MYHM

1. U09MYHM is an oleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross T00A3HM/U05SILM. T00A3HM and U05SILM are both Pioneer proprietary lines. Selections were made for oleic and oil content, shorter plant stature, earlier flowering and yield, as assessed in hybrid combinations. The pedigree method was used in the development of U09MYHM. It is a bulk of F5 seed tracing back to a single F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing U09MYHM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Short  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Horizontal Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Weak intensity  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Descending  
Seed outer pericarp color: Solid black Seed middle pericarp color: White  
Stripe appearance: None Seed shape: Oblong  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a strong intensity of hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.





## U09PESULM

1. U09PESULM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross U06SFLM/B0627LM. U06SFLM and B0627LM are both Pioneer proprietary lines. Selections were made for Express resistance and early flowering maturity. The pedigree method was used in the development of U09PESULM. It is a bulk of F5 seed tracing back to a single F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing U09PESULM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.

3. Maturity (relatively early, medium or late?): Medium  
Height (relatively short, medium or tall?): Medium  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Coarse and shallow serrations  
Leaf attitude: Horizontal Leaf surface: Weak blistering  
Leaf color: Green  
Ray flowers: Narrowly ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped Black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Elipitic  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a strong intensity of hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## U09SGSULM

1. U09SGSULM is a linoleic oil type, restorer line developed by Pioneer Hi-Bred International that derives from the cross B0524LM/U06SFLM. B0524LM and U06SFLM are both Pioneer proprietary lines. Selections were made for Express resistance and early flowering maturity. The pedigree method was used in the development of U09SGSULM. It is a bulk of F5 seed tracing back to a single F4 selection. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.
2. Hybrids utilizing U09SGSULM are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern, and Western Europe.
3. Maturity (relatively early, medium or late?): Early  
Height (relatively short, medium or tall?): Short  
Stem branching: Fully branched  
Leaf shape: Cordate Leaf margins: Medium serrations  
Leaf attitude: Horizontal Leaf surface: Smooth  
Leaf color: Green  
Ray flowers: Narrowly Ovate and flat Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Grey, both marginal and lateral Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field:

It has a strong intensity of hypocotyl anthocyanin.

4. None
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 2011. Please do not publish certified seed production acreage.
7. Application for protection under the Plant Variety Protection Act will not be made.



## SA2178R

1. SA2178R is a Seeds 2000 Inc. linoleic, imidazolinone resistant, oilseed restorer derived from the cross SA219R/SA578R. SA219R is a proprietary line previously described to and approved by the NSVRB. SA578R is a proprietary, imidazolinone resistant line previously described to and approved by the NSVRB. The pedigree method of selection was used for the development of SA2178R. It is a bulk of F6 plants tracing to a single F5 plant. Selection was for uniform plant type, self compatibility, and resistance to imazamox herbicide. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.
2. Hybrids utilizing SA2178R are adapted to major sunflower growing regions of North America and have been tested in North and South Dakota. Hybrids utilizing SA2178R will be used primarily for vegetable oil.
3. Maturity (relatively early, medium or late?): Relatively medium  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: Top Branching  
Leaf shape: Cordate Leaf margins: Medium Serrated  
Leaf attitude: Ascending Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Ascending  
Seed outer pericarp color: Black Seed middle pericarp color: White  
Stripe appearance: Absent Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA2178R is resistant to imidazolinone herbicide
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
7. Application for PVP will not be made.



## SA319

1. SA319 is a Seeds 2000, Inc. non-oilseed, downy mildew resistant maintainer derived from the cross 219B/2/D99B\*2/7835B. 219B is a proprietary, large seeded, non-oilseed maintainer. D99B is a proprietary non-oilseed maintainer line previously described to and approved by the NSVRB. 7835B is a proprietary oilseed maintainer with resistance to downy mildew. The pedigree method of selection was used for the development of SA319. It is a bulk of F6 plants tracing to a single F5 plant. Selection was for uniform plant type, self compatibility, and resistance to downy mildew. The male sterile component of SA319 has cms PET1 cytoplasm derived from H. petiolaris (French).
2. Hybrids utilizing SA319 are adapted to major sunflower growing regions of North America and have been tested in North Dakota and South Dakota. Hybrids utilizing SA319 will be used primarily for human consumption.

3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Ascending  
Seed outer pericarp color: Striped Brown Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA319 is resistant to race 770 of downy mildew
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
7. Application for PVP will not be made.



## SA433R

1. SA433R is a Seeds 2000 Inc. non-oilseed, imidazolinone resistant restorer derived from the cross 1831R/428R. 1831R is a proprietary, non-oilseed restorer. 428R is a proprietary, non-oilseed restorer resistant to imidazolinone herbicide. SA433R is homozygous for dominant fertility restoration of CMS PET1 cytoplasm. The pedigree method of selection was used for the development of SA433R. It is a bulk of F5 plants tracing to a single F4 plant. Selection was for uniform plant type, self compatibility, and resistance to imazamox herbicide.
2. Hybrids utilizing SA433R are adapted to major sunflower growing regions of North America and have been tested in North and South Dakota. Hybrids utilizing SA433R will be used primarily for human consumption.
3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: Top Branching  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Ascending  
Seed outer pericarp color: Striped brown Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA433R is resistant to imidazolinone herbicide
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish acreage.
7. Application for PVP will not be made



## SA435R

1. SA435R is a Seeds 2000, Inc. non-oilseed, imidazolinone resistant, restorer derived from the cross 458R/SA338R. 458R is a proprietary non-oilseed restorer resistant to imidazolinone herbicide. SA338R is a proprietary non-oilseed restorer previously described to and approved by the NSVRB. The pedigree method of selection was used for the development of SA435R. It is a bulk of F5 plants tracing to a single F4 plant. Selection was for uniform plant type, self compatibility, and resistance to imazamox herbicide. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.
2. Hybrids utilizing SA435R are adapted to major sunflower growing regions of North America and have been tested in North and South Dakota. Hybrids utilizing SA435R will be used primarily for human consumption.
3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: Top Branching  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Horizontal  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Narrowly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA435R is resistant to imidazolinone herbicide
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish acreage
7. Application for PVP will not be made.



## SA437R

1. SA437R is a Seeds 2000, Inc. non-oilseed, imidazolinone resistant restorer derived from the cross 428R/SA338R. 428R is a proprietary, non-oilseed restorer resistant to imidazolinone herbicide. SA338R is a proprietary, non-oilseed restorer previously described to and approved by the NSVRB. The pedigree method of selection was used for the development of SA437R. It is a bulk of F6 plants tracing to a single F5 plant. Selection was for uniform plant type, self compatibility, and resistance to imazamox herbicide. SA437R is homozygous for dominant fertility restoration of the CMSPET1 cytoplasm.
2. Hybrids utilizing SA437R are adapted to major sunflower growing regions of North America and have been tested in North and South Dakota. Hybrids utilizing SA437R will be used primarily for human consumption.
3. Maturity (relatively early, medium or late?): Relatively late  
Height (relatively short, medium or tall?): Relatively tall  
Stem branching: Top Branching  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Descending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Narrowly ovate  
Seed cross-section: Curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA437R is resistant to imidazolinone herbicide
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish acreage
7. Application for PVP will not be made.



## SA446

1. SA446 is a Seeds 2000, Inc. non-oilseed, downy mildew resistant, imidazolinone resistant, maintainer derived from the cross SA321/2/SA398/SA440. SA321 is a proprietary downy mildew resistant line previously described to and approved by the NSVRB. SA398 is a proprietary line previously described to and approved by the NSVRB. SA440 is a proprietary, imidazolinone resistant line previously described to and approved by the NSVRB. The pedigree method of selection was used for the development of SA446. It is a bulk of F6 plants tracing to a single F5 plant. Selection was for uniform plant type, self compatibility, downy mildew resistance, and resistance to imazamox herbicide. The male sterile component of SA446 has cms PET1 cytoplasm derived from H. petiolaris (French).
2. Hybrids utilizing SA446 are adapted to major sunflower growing regions of North America and have been tested in North Dakota and South Dakota. Hybrids utilizing SA446 will be used primarily for human consumption.
3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Horizontal  
Seed outer pericarp color: Striped Brown Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA446 is resistant to imidazolinone herbicide and resistant to race 770 of downy mildew
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
7. Application for PVP will not be made.





## SA4614R

1. SA4614R is a Seeds 2000, Inc. high oleic (92.5%), imidazolinone resistant, restorer derived from the cross SA556R/SA406R. SA556R is a proprietary, high oleic, imidazolinone resistant line previously described to and approved by the NSVRB. SA406R is a proprietary, high oleic line previously described to and approved by the NSVRB. The pedigree method of selection was used for the development of SA4614R. It is a bulk of F6 plants tracing to a single F5 plant. Selection was for uniform plant type, self compatibility, high oleic acid content, and resistance to imazamox herbicide. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.
2. Hybrids utilizing SA4614R are adapted to major sunflower growing regions of North America and have been tested in North and South Dakota. Hybrids utilizing SA4614R will be used primarily for vegetable oil.
3. Maturity (relatively early, medium or late?): Relatively medium  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: Top Branching  
Leaf shape: Cordate Leaf margins: Finely serrate  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Flat Head (neck) attitude: Horizontal  
Seed outer pericarp color: Black Seed middle pericarp color: White  
Stripe appearance: Narrow dark grey Seed shape: Narrowly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA4614R is resistant to imidazolinone herbicide
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage
7. Application for PVP will not be made



## SA4725

1. SA4725 is a Seeds 2000, Inc. high oleic (89.8%), tribenuron-methyl resistant, oilseed maintainer selected by the pedigree method from the cross SA470/PSU7G. SA470 is a proprietary line previously described to and approved by the NSVRB. PSU7G is a proprietary maintainer with genes for resistance to tribenuron-methyl herbicide. It is a bulk of F8 plants tracing back to a single F7 plant. Selection was for uniform plant type, self compatibility, high oleic acid content, and resistance to tribenuron-methyl herbicide. The male sterile component of SA4725 has cms PET1 cytoplasm derived from H. petiolaris (French).
2. Hybrids utilizing SA4725 are adapted to major sunflower growing regions of North America and have been tested in western Minnesota, North Dakota, and South Dakota. Hybrids utilizing SA4725 will be used primarily for vegetable oil.
3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: absent  
Pollen color: yellow Pappi color: green  
Receptacle shape: flat Head (neck) attitude: horizontal  
Seed outer pericarp color: Black Seed middle pericarp color: White  
Stripe appearance: Dark grey Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: none claimed

4. SA4725 is resistant to tribenuron-methyl herbicide
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
7. Application for PVP will not be made.



## SA6872

1. SA6872 is a Seeds 2000, Inc. high oleic (90.6%), downy mildew resistant, oilseed maintainer derived from the cross SA6835/7266B. SA6835 is a proprietary, linoleic, downy mildew resistant maintainer previously described to and approved by the NSVRB. 7266B is a proprietary, high oleic maintainer. The pedigree method of selection was used for the development of SA6872. It is a bulk of F7 plants tracing to a single F6 plant. Selection was for uniform plant type, self compatibility, high oleic acid content, and resistance to downy mildew.
2. Hybrids utilizing SA6872 are adapted to major sunflower growing regions of North America and have been tested in North Dakota and South Dakota. Hybrids utilizing SA6872 will be used primarily for vegetable oil.
3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively medium  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Ascending  
Seed outer pericarp color: Striped black Seed middle pericarp color: White  
Stripe appearance: Dark grey Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA6872 is resistant to race 770 of downy mildew
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
7. Application for PVP will not be made.



## SA9768

1. SA9768 is a Seeds 2000, Inc. high oleic (89.6%), imidazolinone resistant, downy mildew resistant, oilseed maintainer selected by the pedigree method from the cross SA970/SA6835. SA970 is a proprietary, high oleic, imidazolinone resistant line previously described to and approved by the NSVRB. SA6835 is proprietary, linoleic, downy mildew resistant line previously described to and approved by the NSVRB. It is a bulk of F7 plants tracing back to a single F6 plant. Selection was for uniform plant type, self compatibility, high oleic acid content, and resistance to imazamox herbicide. The male sterile component of SA9768 has cms PET1 cytoplasm derived from H. petiolaris (French).
2. Hybrids utilizing SA9768 are adapted to major sunflower growing regions of North America and have been tested in western Minnesota, North Dakota, and South Dakota. Hybrids utilizing SA9768 will be used primarily for vegetable oil.
3. Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Ascending  
Seed outer pericarp color: Black Seed middle pericarp color: White  
Stripe appearance: Dark grey Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

4. SA9768 is resistant to imidazolinone herbicide and resistant to race 770 of downy mildew
5. Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
6. Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
7. Application for PVP will not be made.



## SA9611

- SA9611 is a non-oilseed maintainer line tracing to the line C96A5-11 developed by Pioneer Hi-Bred International, and licensed for use by Seeds 2000, Inc. The pedigree of C96A5-11 is unknown. The pedigree method of selection was used for the development of SA9611. It is a bulk of F7 plants tracing to a single F6 plant. Selection was for uniform plant type, self compatibility, and large seed. The male sterile component of SA9611 has cms PET1 cytoplasm derived from H. petiolaris (French)
- Hybrids utilizing SA9611 are adapted to major sunflower growing regions of North America and have been tested in North Dakota, South Dakota, and Manitoba, Canada. Hybrids utilizing SA9611 will be used primarily for human consumption.
- Maturity (relatively early, medium or late?): Relatively early  
Height (relatively short, medium or tall?): Relatively short  
Stem branching: None  
Leaf shape: Cordate Leaf margins: Medium serrated  
Leaf attitude: Horizontal Leaf surface: Crinkled  
Leaf color: Green  
Ray flowers: Present Ray flower color: Yellow  
Disk flower color: Yellow Stigma anthocyanin: Absent  
Pollen color: Yellow Pappi color: Green  
Receptacle shape: Convex Head (neck) attitude: Horizontal  
Seed outer pericarp color: Striped brown Seed middle pericarp color: White  
Stripe appearance: Narrow white Seed shape: Broadly ovate  
Seed cross-section: Not curved

State expected variants or other varietal traits that will assist in identification in the field: None claimed

- None claimed
- Breeder's seed will be maintained by Seeds 2000 in nursery rows under bags, or by open pollination in isolated fields. Up to two generations beyond breeder's seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown.
- Certified seed will first be offered for sale in 2011. Please do not publish certified acreage.
- Application for PVP will not be made.

