

## **NATIONAL SUNFLOWER VARIETY REVIEW BOARD**

ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES

APRIL 12, 2005

The Association of Official Seed Certifying Agencies (AOSCA) National Sunflower Variety Review Board (NSVRB) reviewed the following varieties April 12, 2005, at Fargo, North Dakota. The Board recommended the inclusion of these varieties for certification. Seed of these varieties may be certified, providing production meets all the standards of the Certifying Agency of the state in which the seed is grown.

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

Further information on current procedures, application form and details regarding the NSVRB can be obtained from:

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Respectfully submitted,

Jack Ingemansen  
Chair  
National Sunflower Variety Review Board

# NATIONAL SUNFLOWER VARIETY REVIEW BOARD

April 12, 2005  
Fargo, North Dakota

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## **SA 346**

SA 346 is a non-oilseed maintainer selected by the pedigree method from the cross SA 398B / SA 110B. Selection was for uniform plant type, self-compatibility, and large seed. The male-sterile component of SA 346 has cms PET 1 cytoplasm derived from H. petiolaris (French). The cms designation is SA 346A.

Hybrids involving SA 346 are adapted to major sunflower growing regions of North and South America and Europe. Hybrids utilizing SA 346 have been tested in North and South Dakota, Argentina and Hungary.

Compared to the public line HA 288, SA 346 is four days earlier to flower and reach physiological maturity, approximately 10 cm taller, has larger leaves, larger heads, a flatter head shape and longer and larger seed. Seed color of SA 346 is dark brown with narrow white stripes compared to the black and white striped seed of HA 288.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 346 will be offered for sale in 2006. Application will not be made for PVP.

## **SA 578R**

SA 578R is a linoleic oilseed restorer selected by the pedigree method from the cross SA 287R / SA 556R. Selection was for uniform plant type, self compatibility, high oil content, and imazamox resistance. SA 578R has upper stem branching controlled by a recessive gene, and genes for fertility restoration of PET 1 cytoplasm.

Hybrids involving SA 578R are adapted to major sunflower growing regions of North and South America and Europe. Hybrids utilizing SA 578R have been tested in North and South Dakota, Argentina, and Spain.

Compared to the public line RHA 274, SA 578R is ten days later to flower and reach physiological maturity, approximately 12 cm shorter, has fewer and smaller leaves, and is similar in leaf color. Seed color of SA 578R is solid black, similar to seed color of RHA 274. Seed size is smaller, but more broadly ovate than seed of RHA 274. Heads of SA 578R are rounder, more convex, and held more upright than heads of RHA 274.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 578R will be offered for sale in 2006. Application will not be made for PVP.

## **SA 878**

SA 878 is a linoleic oilseed maintainer selected by the pedigree method from the cross SA 970 / SA 728. Selection was for uniform plant type, self compatibility, and resistance to imazamox herbicide. The male-sterile component of SA 878 has cms PET 1 cytoplasm derived from H. petiolaris (French). The cms designation is SA 878A.

Hybrids involving SA 878 are adapted to major sunflower growing regions of North and South America and Europe. Hybrids utilizing SA 878 have been tested in North and South Dakota, Argentina, and Spain.

Compared to the public line HA 89, SA 878 is two days earlier to flower, similar in days to reach physiological maturity, is approximately 5 cm shorter, similar in leaf color, and has larger heads, and flatter head shape. Seed color of SA 878 is similar to HA 89, but seed is narrower, longer, and heavier than seed of HA 89. SA 878 seed color is black with distinct gray marginal and lateral stripes.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 878 will be offered for sale in 2006. Application will not be made for PVP.

## **SA 970**

SA 970 is a high oleic maintainer selected by the pedigree method from the cross SA 470\*4 / KSW. Selection was for uniform plant type, self compatibility, high oleic acid content (87.3%), and resistance to imazamox herbicide. The male-sterile component of SA 970 has cms PET 1 cytoplasm derived from H. petiolaris (French). The cms designation is SA 970A.

Hybrids involving SA 970 are adapted to major sunflower growing regions of North and South America and Europe. Hybrids utilizing SA 970 have been tested in North and South Dakota, Argentina, and Spain.

SA 970 is five days later to flower and reach physiological maturity than HA 89. Compared to HA 89, SA 970 is approximately 10 cm shorter, similar in leaf color, has a flatter head shape, and is similar in seed shape and color, but has slightly longer seed and slightly heavier seed weight. SA 970 seed color is black with faint gray marginal and lateral stripes.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 970 will be offered for sale in 2006. Application will not be made for PVP.

## **SA 6835**

SA 6835 is a linoleic oilseed maintainer selected by the pedigree method from the cross SA 698 / HA 335. Selection was for uniform plant type, self compatibility, and downy mildew resistance. The male-sterile component of SA 6835 has cms PET 1 cytoplasm derived from H. petiolaris (French). The cms designation is SA 6835A.

Hybrids involving SA 6835 are adapted to major sunflower growing regions of North and South America and Europe. Hybrids utilizing SA 6835 have been tested in North and South Dakota, Argentina, and Hungary.

SA 6835 is three days later to flower, and two days later to reach physiological maturity than HA 89. Compared to HA 89, SA 6835 is approximately 5 cm taller, and is similar in leaf color and head shape. Seed color of SA 6835 is similar to seed color of HA 89, but the seed is longer, less ovate, and similar in seed weight. SA 6835 seed color is black with faint gray marginal and lateral stripes.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 6835 will be offered for sale in 2006. Application will not be made for PVP.

## **SA 440**

SA 440 is a non-oilseed maintainer selected by the pedigree method from the cross SA 398/3/SA 110/2/SA 65/KSW. Selection was for uniform plant type, self-compatibility, large seed, and imazamox resistance. The male-sterile component of SA 440 has cms PET 1 cytoplasm derived from H. petiolaris (French). The cms designation is SA 440A.

Hybrids involving SA 440 are adapted to major sunflower growing regions of North and South America. Hybrids utilizing SA 440 have been tested in North and South Dakota and Argentina.

Compared to the public line HA 288, SA 440 is two days earlier to flower, three days earlier to reach physiological maturity, approximately 14 cm taller, similar in leaf color, has larger leaves, larger heads, and flatter head shape. Seed of SA 440 is longer and larger than seed of HA 288. Seed color of SA 440 is brown with white stripes compared to the black and white striped seed of HA 288.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 440 will be offered for sale in 2006. Application will not be made for PVP.



## **SA 467R**

SA 467R is a non-oilseed restorer selected by the pedigree method from the cross SA 334/2/SA 147/IMI 9607. Selection was for uniform plant type, self-compatibility, and imazamox resistance. SA 467R has upper stem branching controlled by a recessive gene, and genes for fertility restoration of PET 1 male-sterile cytoplasm.

Hybrids involving SA 467R are adapted to major sunflower growing regions of North and South America. Hybrids utilizing SA 467R have been tested in North and South Dakota and Argentina.

Compared to the public line RHA 294, SA 467R is two days earlier to flower and reach physiological maturity, approximately 10 cm taller, has larger leaves, similar leaf color, and similar head size, shape, and head attitude. Seed of SA 467R is longer, heavier, and larger than seed of RHA 294. Seed color of SA 467R is similar to the black and white striped seed of RHA 294.

Breeders seed will be maintained by Seeds 2000 in nursery rows, or by open pollination in isolated fields. Up to two generations beyond breeders seed will be allowed for production of foundation seed. Isolation and other requirements will be according to the seed certification regulations of the state where seed is grown. Certified seed of hybrids using SA 467R will be offered for sale in 2006. Application will not be made for PVP.

## 25037

25037 is a high-oleic, IMI (imidazolinone herbicide) tolerant sunflower B-line, resulted from converting the Advanta line F3010HOB into an IMI tolerant line after 5 generations of back-cross followed by 3 selfing generations. The IMI tolerance source used was IMISUN-1, released by the USDA-ARS in 1998. F3010HOB is a B line developed by Advanta from a B-line population (Donor89). Pedigree method was followed along with selection for good agronomics, earliness, oil content and PET1 sterility maintenance. The general and specific combining ability was tested in F5 and F6, respectively. 25037 is the B line of the female 15037, which produces early and mid-early IMI tolerant hybrids, adapted to short and mid season growing areas in the U.S. and Canada. It is an inbred line in normal cytoplasm and a sterility maintainer for cms PET1 sterility. In comparison with HA89, 25037 is 1 day earlier in blooming and 2 days earlier in maturity. It is 5 cm shorter and has 2 more leaves. The leaves are similar in size to HA89, narrower than long, cordate, acuminate, auriculate, finely serrate, with intermediate indentation, and horizontal attitude, smooth surface and of green color. Ray flowers are yellow, slightly longer and wider than the check. The disk flowers and pollen are yellow and pappi are green. The head is larger (2.5 cm in diameter), convex and ascending at maturity, containing more seeds (60) than HA89. Seeds are black with narrow dark-gray stripes, broadly ovate, 2 mm longer and heavier (1.5g/100s), similar as hull percentage and almost 1% higher in oil content. Its oleic level is over 89%. It is more resistant to lodging, neck breakage, and Phomopsis. 25037 is a herbicide (IMI, Beyond) tolerant line. Its hybrids are early or mid-early, so adapted to short and mid season sunflower growing areas of the North Central part of the U.S. and Canada, especially on weedy grounds. The primary uses of the hybrids produced with 25037 are mid-oleic (Nusun) and high-oleic oils. Breeder seed is produced under bags and Foundation seed under cages or isolated plots. Production is conducted according to the seed certification regulations. If 25037 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.

## **25038**

25038 is a high-oleic sunflower B-line developed by Advanta from a cross between two elite lines (25320/3350). Pedigree method was followed along with selection for good agronomics, earliness, oil content and PET1 sterility maintenance. The general and specific combining ability was tested in F5 and F6, respectively. 25038 is the B line of the female 15038, which produces early and mid-early hybrids, adapted to short and mid season growing areas in the U.S. and Canada. It is an inbred line in normal cytoplasm and a sterility maintainer for cms PET1 sterility. In comparison with HA89, 25038 is 3 days earlier in blooming and 4 days earlier in maturity. It is similar as plant height and has 2 more leaves. The leaves are similar in size to HA89, narrower than long, cordate, acuminate, auriculate, finely serrate, with intermediate indentation, and horizontal attitude, smooth surface and of green color. Ray flowers are yellow, slightly longer and wider than the check. The disk flowers and pollen are yellow and pappi are green. The head is larger (2.5 cm in diameter), convex and ascending at maturity, containing more seeds (30) than HA89. Seeds are black with very narrow dark-gray stripes, broadly ovate, 2 mm longer and heavier (1.5g/100s), has lower (1.8%) hull percentage and is almost 2% higher in oil content. Its oleic level is over 90%. It is more resistant to lodging, neck breakage, and Phomopsis. 25038 and its hybrids are early and mid-early, so adapted to short and mid season sunflower growing areas of the North Central part of the U.S. and Canada. The primary uses of the hybrids produced with 25038 are mid-oleic (Nusun) and high-oleic oils. Breeder seed is produced under bags and Foundation seed under cages or isolated plots. Production is conducted according to the seed certification regulations. If 25038 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.

## **35034**

35034 is a sunflower elite restorer line developed by Advanta North America, Inc. by selfing in a single-cross hybrid between two Advanta experimental R lines. Pedigree method was followed along with selection for pollen fertility restoration, downy-mildew (Race 2), Sclerotinia tolerance and good agronomics. A single F5 plant was selfed to produce the first Breeder seed of 35034. This line is a recessive branched restorer (with large central head), homozygous for the Rf1 gene in Pet 1 cytoplasm. It is a very good combiner, producing high yielding medium and m. late hybrids. In comparison with RH801, 35034 is 5 days later in blooming and 6 days later in maturity, 10 cm taller and has 5 fewer leaves. The leaves are similar in size, wider than long, cordate, acuminate, auriculate, finely serrate, with shallow indentation, ascending attitude, smooth surface and of green color. Ray flowers are yellow and pappi green. The central head is 7.0 cm larger, convex and ascending at maturity, containing 310 more seeds than RHA801. Seeds are nearly solid black-brown, narrowly ovate, 2 mm shorter, and heavier. In comparison with RHA274, 35034 has similar reaction to downy mildew (Race 2) and is more resistant to lodging and neck breakage. In comparison with RHA801, 35034 is more resistant to Sclerotinia head rot and Phomopsis, and has a similar reaction to Verticillium. Hull percentage is around 0.9% lower, and oil content around 1.9% higher. The sunflower 35034 and its hybrids are medium to m. late in maturity, so adapted to mid and long season sunflower growing areas of the U.S., especially in S. Dakota and High Plains. The primary uses of the hybrids produced with 35034 are conventional and NuSun (mid-oleic) oils. Breeder seed is produced under bags and Foundation and Basic seed are increased under cages or isolated plots. Production is conducted according to the seed certification regulations. If 35034 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.

## **35035**

35035 is a sunflower elite restorer line developed by Advanta North America, Inc. by selfing in a single-cross hybrid between two Advanta experimental R lines. Pedigree method was followed along with selection for pollen fertility restoration, downy-mildew (Race 4), Sclerotinia and Phomopsis tolerance and good agronomics. A single F6 plant was selfed to produce the first Breeder seed of 35035. This line is a recessive branched restorer (with large central head), homozygous for the Rf1 gene in Pet 1 cytoplasm. It is a very good combiner, producing high yielding medium-early hybrids. In comparison with RH801, 35035 is 2 days later in blooming and 3 days later in maturity, 5 cm taller and has 2 fewer leaves. The leaves are similar in size, wider than long, cordate, acuminate, auriculate, finely serrate, with intermediary indentations, ascending attitude, crinkled surface and of green color. Ray flowers are yellow and pappi green. The central head is 6.0 cm larger, convex and ascending at maturity, containing 255 more seeds than RHA801. Seeds are nearly solid dark-gray, narrowly ovate, similar in length, and heavier. In comparison with RHA801, 35035 is total resistant to downy mildew (Race 4) and is more resistant to lodging and neck breakage, and Phomopsis. Hull percentage is similar to RHA801, and oil content around 1.7% higher. The sunflower line 35035 and its hybrids are medium-early in maturity, so adapted to mid season sunflower growing areas of the U.S., southern ½ of N. Dakota and northern ½ of S. Dakota, especially where infection of new races of downy-mildew is a main concern. The primary uses of the hybrids produced with 35035 are conventional and NuSun (mid-oleic) oils. Breeder seed is produced under bags and Foundation and Basic seed are increased under cages or isolated plots. Production is conducted according to the seed certification regulations. If 35035 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.

## **35036**

The sunflower line 35036 is an IMI (imidazolinone herbicide) tolerant R-line resulted from converting the Advanta line 35021 into an IMI tolerant line after 5 generations of back-cross, followed by 3 selfing generations. The IMI tolerance source used was IMISUN-1, released by USDA-ARS in 1998. The line 35021 was developed from a very early complex pollen fertility restorer population. Pedigree method was followed along with selection for restoration, oil content, and downy-mildew (Race 2) resistance. F4 offspring were tested for combining ability. A single F6 plant from a selected offspring was selfed to produce next generations of 35021. 35036, IMI tolerant version of 35021, is a recessive branching restorer, homozygous for RF1 gene in CMS PET1 cytoplasm. It is fully branched with central head. Most of its hybrids are very early-early genotypes. In comparison with RHA274, it is 5 days earlier in flowering and 6 days earlier in maturity. It is 46 cm shorter, and shows 5 fewer leaves. The leaves are slightly smaller, wider than long, cordate, acuminate, truncate, medium serrate, with intermediate indentation, descending, with rather crinkled surface, and light green (lighter than RHA274). The petiole is about 3 cm shorter. Ray flowers are yellow, slightly shorter and narrower than RHA274. The anthocyanin is present on stigmas. The disk flower and pollen are yellow, and the pappi is green. The head is smaller than RHA274 (1.5 cm in diameter), flat and horizontal by maturity. Seed are of dark-brown to black color, and are close to RHA274 in size and form, but they are smaller and lighter (-1.0gr/100 seed). 35036 is resistant to downy-mildew (Race 2) and to IMI (imidazolinone) Beyond herbicide. It shows better resistance to lodging and neck breakage, lower hull percentage (-2%), and higher oil content (8.3%) than RHA274. The sunflower line 35036 and its hybrids are early or mid-early, so well adapted to short and mid-season sunflower growing areas of North Central of the U.S., especially on weedy lands. The primary uses of hybrids produced with 35036 are conventional (high linoleic) and NuSun (mid-oleic) oils. Breeder seed is produced under bags, and Foundation and Basic seed is increased under cages or in isolated plots. Production is conducted according to the seed certification regulations. If 35036 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.

## **35037**

35037 is a sunflower elite confection restorer line developed by Advanta North America, Inc. by selfing in a single-cross hybrid between two Advanta experimental R lines (S40880/65101). Pedigree method was followed, along with selection for pollen fertility restoration, downy-mildew (Race 2), Phomopsis tolerance, good agronomics and seed size, shape and color. A single F6 plant was selfed to produce the first Breeder seed of 35037. This is a one headed restorer, homozygous for the Rf1 gene in Pet 1 cytoplasm. It is a very good combiner, producing high yielding, very long, large seeded confection hybrids. In comparison with RH294, 35037 is 2 days later in blooming and 2 days later in maturity, 5 cm taller and has similar number of leaves. The leaves are larger and wider, wider than long, cordate, acuminate, auriculate, medium serrate, with intermediary indentations, horizontal attitude, crinkled surface and of green color. Ray flowers are yellow and pappi green. The head is 8.0 cm larger, flat and horizontal at maturity, containing 155 more seeds than RHA294. Seeds are nearly solid gray, oblong, 7 mm longer, and heavier. 35037 is total resistant to downy mildew (Race 2) and is more resistant to lodging, neck breakage, and Phomopsis. Hull percentage is higher than RHA294. The sunflower 35037 and its hybrids are medium in maturity, so adapted to mid season sunflower growing areas of the U.S., especially in N. Dakota and S. Dakota. The primary uses of the hybrids produced with 35037 are in-shell and kernel confection products. Breeder seed is produced under bags and Foundation and Basic seed are increased under cages or isolated plots. Production is conducted according to the seed certification regulations. If 35037 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.

## **35038**

35038 is a sunflower elite confection restorer line developed by Advanta North America, Inc. by selfing in a hybrid resulted from a complex cross of four Advanta experimental R lines. Pedigree method was followed, along with selection for pollen fertility restoration, downy-mildew (Race 2), Phomopsis tolerance, good agronomics and seed size, shape and color. A single F6 plant was selfed to produce the first Breeder seed of 35038. This is a single headed restorer, homozygous for the Rf1 gene in Pet 1 cytoplasm. It is a very good combiner, producing high yielding, very long, large seeded confection hybrids. In comparison with RH294, 35038 is 5 days later in blooming and 4 days later in maturity, 30 cm taller and has 2 more leaves. The leaves are larger and wider, wider than long, cordate, acuminate, auriculate, medium serrate, with intermediary indentations, horizontal attitude, crinkled surface and of green color. Ray flowers are yellow and pappi green. The head is 8.5 cm larger, flat and horizontal at maturity, containing 235 more seeds than RHA294. Seeds are dark-gray to black with narrow white stripes, oblong, 9 mm longer, and heavier. 35038 is total resistant to downy mildew (Race 2) and is more resistant to lodging, neck breakage, and Phomopsis. Hull percentage is higher than RHA294. The sunflower line 35038 and its hybrids are medium to m. late in maturity, so adapted to mid and long season sunflower growing areas of the U.S., especially in S. Dakota and High Plains. The primary uses of the hybrids produced with 35038 are in-shell and kernel confection products. Breeder seed is produced under bags and Foundation and Basic seed are increased under cages or isolated plots. Production is conducted according to the seed certification regulations. If 35038 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for P.V.P.



## 25039

The sunflower confection B-line 25039 was developed by Advanta Seed Co. from a long, large seeded confection B line population. Pedigree method was followed along with selection for good agronomics, seed size, shape and color, and for PET 1 sterility maintenance. The general and specific combining ability was tested in F5 and F6, respectively. 25039 is the B line of the female 15039 which produces medium maturity long, large seeded confection hybrids, adapted to mid season growing areas in the U.S. and Canada. It is an inbred line in normal cytoplasm and a sterility maintainer for cms PET 1 sterility. Subsequent selections were performed for seed size, shape, color and plant uniformity. In 2002 it was increased under a cage in Mapleton, ND to produce the first Foundation seed. In comparison with HA292, 25039 is similar in blooming and 2 days later in maturity. It is 10 cm taller and has 2 more leaves. It shows no branches and has green growing point. The leaves are similar in size to HA292, wider than long, cordate, acuminate, auriculate, medium serrate, with intermediate indentation, horizontal attitude, smooth surface, and of green color. Ray flowers are yellow, and similar to HA292. The disk flowers and pollen are yellow and pappi are green. The head is larger (1.5 cm in diameter), flat and descending at maturity, containing more seeds (55) than HA292. Seeds are dark-gray with white edge, elliptic as shape, 2.5 mm longer and heavier (1.6g/100s), and similar in hull percentage. 25039 is more resistant to lodging and neck breakage. Breeder seed is produced under bags and Foundation seed under cages or isolated plots. Production is conducted according to the seed certification regulations. If 25039 is accepted by official certifying agencies, certified seed will be first offered for sale in 2005. For present, application will not be made for PVP.

## **37024**

37024 is a high linoleic, unbranched, pollen fertility restorer line developed by Advanta Iberica, Spain. It was derived from a cross between two Advanta experimental R lines. Pedigree method was followed along with selection for pollen fertility restoration, good agronomics, oil content and Orobanche resistance. Marker assistant selection was used to speed up the process of line development. The general and specific combining ability was tested in F4 and F5, respectively. F6 selected plant was increased under the bag to produce the first Breeder seed of 37024. It is inbred line in PET 1 sterile cytoplasm. In comparison with RHA274, 37024 is 6 days later in blooming and 12 days later in maturity. It is around 38 cm taller and has 11 leaves more than RHA274. Plants are unbranched. The leaves are shorter and wider than RHA274, cordate, auriculate, medium serrate, with shallow indentation, and ascending attitude, crinkled surface and of green color. Ray flowers are orange yellow, shorter and with a similar width than RHA274. The disk flowers and pollen are yellow and pappi are green. The head is almost 9 cm wider than the one of RHA274, convex, and descending at maturity, containing more number of seeds than RHA247. Seeds are narrow dark-gray striped, narrowly ovate, longer and heavier than the seeds of RHA247. 37024 is resistant to race E and the new race of Orobanche in Spain. It has lower hull percentage and higher oil content (+5.98%) than RHA274. 37024 and its hybrids are primarily adapted to the sunflower areas of Spain and Turkey infested with the new races of Orobanche, as well as to some areas of the US, especially in High Plains. Breeder seed is produced under bags, and Foundation and Basic seed is increased under cages or isolated plots. Production is conducted according to the seed certification regulations. If 37024 is accepted by official certifying agencies, certified seed will be first offered for sale in 2006. For present, application will not be made for P.V.P.

## **37025**

37025 is a sunflower restorer inbred line developed by Advanta Iberica, Spain. It was derived from a cross of an Advanta elite restorer line with a bulk of pollen from an experimental R line population. Back-cross method, assisted with molecular marker and embryo culture technology were followed to incorporate resistance to the new races of *Orobanche cumana*, occurring presently in Spain. Selection for pollen fertility restoration, good agronomics, and high oil content was performed each generation. This line is a recessive branched restorer, homozygous for the Rf1 gene in PET1 sterile cytoplasm, of medium maturity. In comparison with RHA274, 37025 is 4 days later in blooming and 6 days later in maturity. It is around 13 cm taller and has 8 leaves more than RHA274. It is used to produce conventional oil hybrids, adapted to mid season sunflower growing areas of Southern Europe, particularly Spain and Turkey, as well as to some areas of the US. The leaves are shorter and narrower than RHA274, narrow triangular to broad triangular, acuminate, truncate, medium serrate, with shallow indentation, and ascending attitude, medium crinkled surface and of green color. Ray flowers are orange yellow, shorter and wider than RHA274. The disk flowers and pollen are yellow and pappi are green. Anthocyanin in stigmas is present. The head is almost 2 cm wider than the one of RHA274, it is concave, and descending at maturity, containing more number of seeds than RHA274. Seeds are dark brown with light brown stripes, narrowly ovate, longer and heavier than the seeds of RHA274. 37025 is resistant to race E and the new race of *Orobanche* in Spain. It has lower hull percentage and higher oil content (+8.6%) than RHA274. 37025 is primarily adapted to the sunflower area of Spain and Turkey, as well as in some areas of the US. The primary use of hybrids produced with 37025 is conventional oil. Breeder seed is produced under bags, and Foundation and Basic seed is increased under cages or isolated plots. Production is conducted according to the seed certification regulations. For present, application will not be made for P.V.P.

## **B0304LG**

B0304LG is a conventional linoleic oil type female line developed by Pioneer Hi-Bred International. B0304LG derives from the backcross PHA320<3FXT020LG PHA320 and FXT020LG are Pioneer proprietary lines. FXT020LG was used as a donor for the P16 locus which conveys resistance to several Downy Mildew races including races 703 and 710. B0304LG is fixed for the P16 locus and is a new, Downy Mildew resistant version of PHA320. The pedigree method was used in the development of B0304LG. It is a bulk of seed from F4 plant tracing back to a single F3 plant. The sterile analog derives from the CMS PET1 cytoplasm following 3 generations of backcrossing.

Hybrids utilizing B0304LG are adapted to the Northern Plains of the U.S. and Sunflower Growing regions in Central and Eastern Europe.

B0304LG is a mid maturity maintainer line. It blooms at 61 days, which is 8 days earlier than HA371, and matures at 101 days, which is the same as HA371. B0304LG is 115 cm tall, which is 45 cm shorter than HA371. It has large, green, erect, cordate leaves with coarse serrations of intermediate depth. B0304LG has 32 leaves, which is 1 less leaf than HA371. The leaves are 26 cm long and 28 cm wide, which are 4 cm longer and 4.5 cm wider than the leaves of HA371. The yellow ray flowers are 62 mm long and 14 mm wide, which are 3 mm shorter and 3 mm narrower than HA371. The medium-large convex head is 17 cm wide, which is 4 cm narrower than the head of HA371. The head is held in a descending position. The solid black, narrowly ovate seeds are 10 mm long and weigh 5.4 grams per 100 seeds, which is 1mm shorter and 1.6 g lighter per 100 seeds than HA371. B0304LG yields 525 seeds per head compared to 1000 seeds per head for HA371.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **B0306LG**

B0306LG is a conventional linoleic oil type female line, developed by Pioneer Hi-Bred International, that derives from the backcross VK106G<4FXT006LG. VK106G and FXT006LG are Pioneer proprietary lines. FXT020LG was used as a donor for the P16 locus which conveys resistance to several Downy Mildew races including races 703, 710. B0306LG is fixed for the P16 locus and is a new, Downy Mildew resistant version of VK106G. The pedigree method was used in the development of this line. It is a bulk of F5 seed tracing back to a single F3 selection. The sterile analog derives from the CMS PET1 cytoplasm following 3 generations of backcrossing. It is homozygous dominant for single heads.

Hybrids utilizing B0306LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern and Western Europe.

B0306LG is a medium maturing female line that blooms at 59 days, which is 10 days earlier than HA371, and matures at 100 days, which is 1 day earlier than HA371. B0306LG is 131 cm tall, which is 29 cm shorter than HA371. It has large sized, horizontal, green cordate leaves with shallow, fine serrations. The leaves are 29 cm long and 36 cm wide and are 7 cm longer and 12 cm wider than HA371. B0306LG has 28 leaves, five fewer than HA371. The large convex head is held in a slightly descending position. The head is 21 cm in diameter which is the same as HA371. The yellow ray flowers are 71 mm long and 19 mm wide, 6 mm longer and 2 mm wider than HA371. The oblong shaped seed is black with narrow dark-gray stripes that occur both laterally and marginally. The seed is 10 mm long which is 1 mm shorter than HA371. The seeds weigh 7.4 g/100 seeds which is 0.4 g lighter than HA371. B0306LG yields about 1000 seeds per head which is the same as HA371.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **B0345HM**

B0345HM is a high oleic oil type male line, developed by Pioneer Hi-Bred International, that derives from the backcross PHA232<3PHA305. PHA232 and PHA305 are Pioneer proprietary lines. PHA305 was used as a donor for its high oleic fatty acid profile. B0345HM is fixed for the high oleic phenotype and is a new, high oleic version of PHA232. Fatty acid profile data for B0345HM can be found in appendix 1. The pedigree method was used in the development of this line. It is a bulk of seed from F6 plants tracing back to a single F3 plant. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

Hybrids utilizing B0345HM are adapted to the growing regions of the Northern Plains of the U.S. and Central and Eastern Europe.

B0345HM is a top branching restorer line with a central head. It blooms at 69 days, which is 5 days later than RHA801, and matures at 95 days, which is the same as RHA801. B0345HM is 139 cm tall, which is 27 cm taller than RHA801. It has medium sized, ascending, green, cordate leaves with fine serrations. B0345HM has 25 leaves, which is 1 leaf fewer than RHA801, and the leaves are 23 cm long and 24 cm wide which are 5 cm longer and 6 cm wider than RHA801. The yellow ray flowers are 70 mm long and 19 mm wide, which are 19 mm longer and 9 mm wider than RHA801. The small convex head is 11 cm wide, which is the same as RHA801, and it is held in a descending position. The elliptical seeds are 10 mm long and weigh 2.4 grams per 100 seeds, which are 1 mm longer and 1.1 grams lighter per 100 seeds than RHA801. The seed are solid dark brown to black with no stripes, but there is a possibility of some light to medium brown seeds coming from the centers of the head. B0345HM yields 425 seeds per head, which is 25 seeds more than RHA801.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2005.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **B0388LG**

B0388LG is a conventional linoleic oil type female line, developed by Pioneer Hi-Bred International. B0388LG derives from the backcross PHA088<2R0055LG. PHA088 is a Pioneer proprietary line. R0055LG is a Pioneer proprietary line that was derived by crossing another Pioneer proprietary line VKD612LG with the USDA pollen release IMISUN-1. IMISUN-1 was utilized as a donor of the mutation that gives rise to Imazimox resistance. B0388IG is resistant to Imazimox herbicide and is a new herbicide resistant version of PHA088. The pedigree method was used in the development of this line. It is a bulk of seed from F7 plants tracing back to a single F3 plant. The sterile analog derives from the CMS PET1 cytoplasm following four generations of backcrossing.

Hybrids utilizing B0388LG are adapted to the Northern Plains of the U.S. and Sunflower Growing regions in Argentina.

B0388LG is a maintainer line that blooms at 69 days, which is the same as HA371, and matures at 106 days, which is 5 day later than HA371. B0388LG is 132 cm tall, which is 28 cm shorter than HA371. It has large sized, horizontal, green cordate leaves with medium serrations. The leaves are 30 cm long and 32 cm wide and are 8 cm longer and 8 cm wider than the leaves of HA371. B0306LG has 36 leaves, which is 3 more than HA371. The large convex head is 21 mm wide, which is the same as the head of HA371, and it is held in a descending position. The head is 21 cm in diameter which is the same as HA371. The yellow ray flowers are 49 mm long and 21 mm wide, which are 12 mm shorter and 4 mm wider than HA371. The narrowly ovate seeds are 11 mm long and weigh 6 grams per 100 seed, which are the same length and 1 gram lighter per 100 seeds than HA371, and are black with gray stripes both laterally and marginally. B0388LG yields 750 seeds per head compared to 1000 seeds per head for HA371.

B0388LG is an Imazimox resistant version of PHA088. Herbicide resistance data for B0388LG may be found in Appendix 1.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **B0398LM**

B0398LM is a conventional linoleic oil type male line, developed by Pioneer Hi-Bred International, that derives from the backcross PHA210×6IMISUN-2. PHA210 is a Pioneer proprietary line. IMISUN-2 is a release from the USDA breeding program in Fargo, North Dakota. IMISUN-2 was used as a donor for the ALS mutation that gives rise to Imazimox resistance. B0398LM is fixed for resistance to Imazimox and is a new, Imidazilone resistant version of PHA210. The pedigree method was used in the development of this line. It is a bulk of seed from F4 plants tracing back to a single F3 plant. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.

Hybrids utilizing B0398LM are adapted to the growing regions in Argentina.

B0398LM is a fully branching type restorer line. It blooms at 69 days, which is the same as RHA271, and matures at 94 days, which is 10 days earlier than RHA801. B0398LM is 130 cm tall, which is 29 cm shorter than RHA271. It has erect, medium sized, green cordate leaves with medium serrations. B0398LM has 28 leaves, which is 1 more leaf than RHA271, and the leaves are 27 cm long and 29 cm wide, which are the same length and 6 cm wider than RHA271. The yellow ray flowers are 57 mm long and 14 mm wide, which are 3 mm shorter and 2 mm narrower than RHA271. The medium sized convex head is 14 cm wide at maturity, which is 3 cm wider than RHA271. The head is held in a descending position. The small, striped black narrowly ovate seeds are 10 mm long and weigh 4.0 grams per 100 seeds. The seeds are the same length as RHA271 and are 2 grams lighter per 100 seeds than RHA271. The gray stripes on the seeds occur both marginally and laterally. B0398LM yields 250 seeds per head, which is 250 seeds less than RHA271.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.



## **F0003LM**

F0003LM is a conventional linoleic oil type male line, developed by Pioneer Hi-Bred International, that derives from the cross PHA027/PHA061. PHA027 and PHA601 are Pioneer proprietary lines. The pedigree method was used in the development of this line. It is a bulk of seed from F9 plants tracing back to a single F6 plant. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.

Hybrids utilizing F0003LM are adapted to the growing regions Central and Eastern Europe.

F0003LM is a top branching type restorer line with a central head. It blooms at 68 days, which is one day earlier than RHA271, and matures at 108 days, which is 4 days later than RHA801. F0003LM is 132 cm tall, which is 27 cm shorter than RHA271. It has horizontal, medium sized, green cordate leaves with fine serrations of shallow depth. Leaf margin color is yellow. F0003LM has 22 leaves, which is 5 fewer than RHA271. The leaves are 24 cm long and 23 cm wide, which are 3 cm shorter and the same width as RHA271. The yellow ray flowers are 62 mm long and 12 mm wide, which are 2 mm longer and 4 mm narrower than RHA271. The small-sized convex head is 10 cm wide, which is 1 cm narrower than RHA271. The head is held in a descending position. The elliptic seeds are 12 mm long and weigh 3.7 grams per 100 seeds, and are 2 mm longer and 2.3 lighter per 100 seeds than RHA801. The seeds are black with gray stripes that occur both marginally and laterally. F0003LM yields 450 seeds per head, which is 50 seeds less than RHA271.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **FT220**

FT220 is a linoleic oil type restorer line, developed by the French National Institute of Agronomy Research – INRA, and licensed for use by Pioneer Hi-Bred. The pedigree, as provided by INRA is USA inbreds/PRS5. It is homozygous for dominant fertility restoration of the CMS PET 1 cytoplasm.

Hybrids utilizing FT220 are adapted to the growing regions of Central and Eastern Europe.

FT220 is a fully branched restorer line. It blooms at 58 days, which is 11 days earlier than RHA271, and matures at 95 days, which is 9 days earlier than RHA271. FT220 is 120 cm tall, which is 39 cm shorter than RHA271. It has horizontal, medium sized, green cordate leaves with medium serrations of intermediate depth. FT220 has 20 leaves, which is 7 fewer leaves than RHA271. The leaves are 19 cm long and 19 cm wide, and are 8 cm shorter and 4 cm narrower than the leaves of RHA271. The yellow ray flowers are 52 mm long and 10 mm wide, which is 8 mm shorter and 6 mm narrower than RHA271. The medium sized convex head is 11 cm wide, which is the same as RHA271, and it is held in a descending position. The narrowly ovate seeds are 10 mm long and weigh 3.8 grams per 100 seeds, which is the same length and 2.2 grams lighter per 100 seeds than RHA271. The seeds are solid dark black with no stripes, but there is a possibility of some light to medium brown seeds coming from the centers of the head. FT220 yields 350 seeds per head, which is 150 seeds less than RHA271.

Resistant to Downy Mildew Races 100, 300 and 304. (Information provided by INRA).

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.

Seed will be offered for sale in 2006.

No, an application will not be made for protection under the Plant Variety Protection Act.

## **L808B**

L808B is a conventional linoleic oil type female line developed by the Russia Hybrid Industry – RHI, and licensed for use by Pioneer Hi-Bred. The pedigree is unknown. The sterile analog derives from the CMS PET 1 cytoplasm.

Hybrids utilizing L808B are adapted to the growing regions of France, Central and Eastern Europe and the Northern Plains of the U.S.

L808B is a maintainer line. It blooms at 64 days, which is 5 days earlier than HA371, and matures at 96 days, which is 5 days earlier than HA371. Hypocotyl anthocyanin coloration is strong. L808B is 122 cm tall, which is 38 cm shorter than HA371. It has medium sized, ascending, green cordate leaves with medium serrations. L808B has 18 leaves, which is 15 fewer leaves than HA371, and the leaves are 22 cm long and 22 cm wide, which are the same length and 2 cm narrower than the leaves of HA371 respectively. The yellow ray flowers are 69 mm long and 16 mm wide, which are 4 mm longer and 1 mm narrower than those of HA371. The medium convex head is 17 cm wide, which is 4 cm narrower than the head of HA371, and it is held in a descending position. The oblong seeds are 11 mm long and weigh 5.3 grams per 100 seeds, which are the same length and 1.7 grams lighter per 100 seeds than HA371, and are black with gray stripes both laterally and marginally. L808B yields 850 seeds per head compared to 1000 seeds per head for HA371.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

No, an application will not be made for protection under the Plant Variety Protection

## **T00B3**

T00B3 is a high oleic oil type restorer line, developed by Pioneer Hi-Bred International, that derives from the cross PR812M/TRU014LM. PR812M and TRU014LM are Pioneer proprietary lines. The pedigree method was used in the development of this line. It is a bulk of seed from F7 plants tracing back to a single F3 plant. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.

Hybrids utilizing T00B3 are adapted to the growing regions of the Northern Plains of the United States and Central and Eastern Europe.

T00B3 is a top branching restorer with a central head. It blooms at 61 days, which is 2 days earlier than RHA346, and matures at 93 days, which is 1 day earlier than RHA346. T00B3 is 152 cm tall, which is 23 cm taller than RHA346. It has ascending, medium sized, green, cordate leaves with fine serrations of shallow depth. T00B3 has 23 leaves, which is 6 fewer leaves than RHA346. The leaves are 20 cm long and 23 cm wide, which are 3 cm shorter and 2 cm wider than the leaves of RHA346. The yellow ray flowers are 68 mm long and 13 mm wide, which are 4 mm longer and 3 mm wider than RHA346. The medium sized concave head is 9 cm wide, which is 3 cm narrower than RHA346, and it is held in an erect position. The narrowly ovate seeds are 10 mm long and weigh 4.5 grams per 100 seeds, which is the same length and 0.7 grams heavier per 100 seeds than RHA346. The seeds are solid black with no stripes, but there is a possibility of some light to medium brown seeds coming from the centers of the head. T00B3 yields 450 seeds per head, which is 350 seeds less than RHA346.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **T0075LM**

T0075LM is a conventional linoleic oil type male line, developed by Pioneer Hi-Bred International, that derives from the cross T9608LM/PK97M. T9608LM and PK97M are Pioneer proprietary lines. The pedigree method was used in the development of this line. It is a bulk of seed from F6 plants tracing back to a single F4 plant. It is homozygous for dominant fertility restoration of the CMS PET1 cytoplasm.

Hybrids utilizing T0075LM are adapted to the growing regions of Central and Eastern Europe.

T0075LM is a fully branched restorer line. It blooms at 62 days, which is 7 days earlier than RHA271, and matures at 89 days, which is 15 days earlier than RHA271. T0075LM is 139 cm tall, which is 20 cm shorter than RHA271. It has ascending, medium sized, green cordate leaves with medium serrations of intermediate depth. T0075LM has 32 leaves, which is 5 more than RHA271. The leaves are 23 cm long and 25 cm wide, which are 4 cm shorter and 2 cm wider than the leaves of RHA271. The yellow ray flowers are 88 mm long and 18 mm wide, which are 28 mm longer and 2 mm wider than RHA271. The medium sized, descending, convex head is 12 cm wide, which is 1 cm wider than RHA271. The broadly ovate seeds are 10 mm long and weigh 3.8 grams per 100 seeds, which is the same length but 2.2 grams lighter per 100 seeds than RHA271. The seeds are solid black with no stripes, but there is a possibility of some light to medium brown seeds coming from the centers of the head. T0075LM yields 150 seeds per head, which is 350 fewer seeds than RHA271.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## **T9932LG**

T9932LG is a conventional linoleic oil type female line, developed by Pioneer Hi-Bred International, that derives from the cross PK68G\*PK83G/VK31G+HA337\*BULALB. PK68G, PK83G & VK31G are Pioneer proprietary lines. HA337 is a public maintainer line released from the USDA Sunflower breeding program in Fargo, North Dakota. BULALB is the hybrid Albena, which was released by the Institute of Wheat and Sunflower in Dobroudja, Bulgaria. The pedigree method was used in the development of this line. It is a bulk of F8 seed tracing back to a single F4 selection. The sterile analog derives from the CMS PET1 cytoplasm following 4 generations of backcrossing. It is homozygous dominant for single heads.

Hybrids utilizing T9932LG are adapted to the growing regions of the Northern Plains of the U.S. and Central, Eastern and Western Europe.

T9932LG is a mid-late maturing female line that blooms at 64 days and matures at 110 days. T9932LG blooms 5 days earlier and 9 days later than HA371. It has medium sized, green, cordate leaves that have an erect attitude, with moderate, medium serrations. The leaves are 25 cm long and 25 cm wide, which is 3 cm longer and 1 cm wider than HA371. T9932LG has 26 leaves, 7 fewer than HA371. T9932LG has a medium sized convex head is held in a slightly descending position. The yellow ray flowers are 75 mm long and 19 mm wide, which is 10 mm longer and 2 mm wider than HA371. The head is 17 cm in diameter at maturity, which is 4 cm narrower than HA371. T9932LG is 186 cm tall when mature which is 26 cm taller than HA371. The narrowly ovate shaped seeds are nearly solid black and are 12 mm in length, which is 1 mm longer than the seed of HA371. 100 seeds of T9932LG weigh 5.6 grams, which is 1.4 grams lighter than HA371. T9932LG yields 900 seeds/head, which is 100 seeds less than HA371.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

## U9713LG

U9713LG is a conventional linoleic oil type female line, developed by Pioneer Hi-Bred International, that derives from the cross VK40G/ST115. VK40G is a Pioneer proprietary line. ST115 was a commercial hybrid from Seed Tech that is not longer sold. The pedigree method was used in the development of this line. It is a bulk of F11 seed tracing back to a single F5 selection. The sterile analog derives from the CMS PET1 cytoplasm following 6 generations of backcrossing. It is homozygous dominant for single heads.

Hybrids utilizing U9713LG are adapted to the growing regions of Central, Eastern and Western Europe.

U9713LG is a mid-maturing linoleic oil type maintainer line. It is 130 cm tall at maturity, which is 30 cm less than HA371. U9713LG blooms at 64 days, which is 5 days earlier than HA371 and matures at 105 days, which is 4 days later than HA371. It has descending; medium sized green, cordate leaves with medium serrations of intermediate depth. U9713LG has 28 leaves, which is 5 fewer than HA371. The leaves are 26 cm long and 25 cm wide, which is 4 cm longer and 1 cm wider than HA371. The large sized convex head is held in a descending position. The yellow ray flowers are 62 mm long and 14 mm wide, which is 3 mm shorter and 3 mm narrower than HA371. At maturity, the head is 19 cm in diameter, which is 2cm less than HA371. The seed yield is 940 seeds/head, which is 60 seeds less than HA371. The narrowly ovate gray-striped black seeds are 10 mm in length, which is 1 mm shorter than HA371. The stripes on the seeds occur both marginally and laterally. 100 seeds of U9713LG weigh 2.1 g, which is 4.9 g lighter than HA371.

No specific disease resistance or tolerance.

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.

Seed will be offered for sale in 2006.

Yes, an application may be made for protection under the Plant Variety Protection Act and the "Certification Option" will be elected if so made.

### **00-R196**

00-R196 is a multi-headed, confectionery type, restorer line. It stands 89 cm tall with a flowering date of 60 days after emergence as compared to 58 days after emergence of RHA 294. 00-R196 has a medium sized head on a droopy neck and stalk. It is a branched plant but not as profuse as RHA 294. The achenes are 21 mm long. Achenes are black with an occasional white margin. 00-R196 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. No specific insect resistance or disease resistance claims are made. Seed increases will be limited to one generation as foundation seed. Seed of certified hybrids using this inbred would be available for sale for 2006 planting season. Application will not be made for protection under the plant protection act.



## **04-R252**

04-R252 is a multi-headed, confectionery type, restorer line. It stands 112 cm tall with a flowering date of 63 days after emergence as compared to 58 days after emergence of RHA 294. 04-R252 is quick to emerge and stands very well. 04-R252 has a medium size head and a fairly upright neck. The achenes are black with slight to moderate striping. No specific insect resistance or disease resistance claims are made. Application will not be made for protection under the Plant Variety Protection Act.

## **F56451**

F56451 is a high oleic oil-type sunflower maintainer inbred. This inbred was selected after a cross with the private maintainer inbred line F564 and the oleic Russian open pollinated population Pervenets followed by 5 back crosses to F564 and 3 selfing generations. Selection was done on self pollinated plants for high oleic, high oil, recessive gene branching, dominant fertility restoration and resistance to Plasmopara halstedii.

Bulk seeds of the BC5F6 generation were used to constitute breeder seed of F56451. The sterile component of the line (SF56451) was derived from CMS PET 1 (Helianthus petiolaris (French)). Seed of the sterile line was bulked after 5 backcrosses to the maintainer line.

Yellow green growing point

Flowering equal to HA89

10 to 15 cm taller than HA89

Ratio bract length to capitulum radius 0.8 for F56451 and 0.4 for HA89

Head attitude more upright than HA89

Seed striping narrow for HA89 and wide for F56451

Oil content: 1-2% less than HA89

High oleic

Up to two generation beyond breeder seed will be allowed for foundation seeds. This will be produced under open pollination in isolation. Breeder seed to be maintained in nursery rows under controlled bagging or in caged isolation.

Application will not be made for PVP.

## **FR81055**

Hybrids involving FR81055 have been tested and found adapted to the major sunflower production areas of the USA, Argentina, France, Hungary, Russia, Ukraine, Spain and Turkey. This inbred is resistant to Plasmopara halstedii (Race 710), Orobanche cummana (Race E) and tolerant to Phomopsis helianthi.

Shorter plants than RHA274  
3 to 5 days earlier in flowering than RHA274  
Bud appearance open  
Fully branched with small heads on branches  
Very big central head  
Usually vertical attitude  
Resistant to Orobanche cummana  
More resistant to Phomopsis helianthi than RHA274  
3% more oil content than RHA274  
High Oleic  
Anthocyanin in stigmas

Up to two generation beyond breeder seed will be allowed for foundation seeds. This will be produced under open pollination in isolation. Breeder seed to be maintained in nursery rows under controlled bagging or in caged isolation.

Application will not be made for PVP.