CORN
(Zea mays)

Proposed denomination: **'2ZBSS1001'**
Application number: 21-10492
Application date: 2021/05/03
Applicant: Agrigenetics, Inc., Indianapolis, Indiana, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Stipe Vujevic, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH18F6'

Summary: *The leaf blade just above the upper ear of '2ZBSS1001' has a medium degree of undulation of the margin whereas that of 'PH18F6' has strong undulation of the margin. The apex and middle of the glumes on the tassel of '2ZBSS1001' have a medium intensity of anthocyanin colouration whereas those of 'PH18F6' have absent or very weak intensity of anthocyanin colouration. In the middle third of the main branch of the tassel, the anthers of '2ZBSS1001' have absent or very weak intensity of anthocyanin colouration whereas those ofr 'PH18F6' have medium intensity of anthocyanin colouration. The main axis above the lowest lateral branch of the tassel of '2ZBSS1001' is very short whereas that of 'PH18F6' is long. The main axis above the highest lateral branch of the tassel of '2ZBSS1001' is short whereas that of 'PH18F6' is long. The lateral branches on the tassel of '2ZBSS1001' are short whereas those of 'PH18F6' are long. The primary ear of '2ZBSS1001' is located higher on the stem than that of 'PH18F6'. The ear of '2ZBSS1001' is shorter, and including the kernels, has a smaller diameter than that of 'PH18F6'.*

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis and silk emergence occur late in season

STEM: absent or very slight degree of zig-zag, very strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, small angle with stem, slightly recurved

TASSEL: few number of primary lateral branches, medium density of spikelets on middle third of main branch, very short main axis above lowest lateral branch, short main axis above highest lateral branch
LATERAL BRANCHES: straight, medium angle with main axis, short
GLUME: absent or very weak intensity of anthocyanin colouration at base, medium intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, short
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: '2ZBSS1001' was developed by Agrigenetics, Inc. using a pedigree method of plant breeding. In 2006, a three-way cross was conducted between proprietary inbred lines in Arlington, Wisconsin, USA. Selected F1 ears were selfed with subsequent ear to row selections conducted from the F2 to F6 generations with final selections being conducted in 2010. '2ZBSS1001' was selected based on tassel size, pollen production, germination ability, stalk lodging

resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The F8 seed was bulked as breeder seed in Arlington, Wisconsin, USA in 2011.

Tests and Trials: The comparative trial for '2ZBSS1001' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000303, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for '2ZBSS1001'

	'2ZBSS1001'	**'PH18F6'***
Primary ear height (metres)		
mean	0.85	0.67
std. deviation	0.06	0.08
Ear length (cm)		
mean	15.72	16.35
std. deviation	0.71	0.92
Ear diameter (including kernels) (cm)		
mean	3.88	4.39
std. deviation	0.22	0.12

*reference variety

Corn: '2ZBSS1001' (left) with reference variety 'PH18F6' (right)

Corn: '2ZBSS1001' (top) with reference variety 'PH18F6' (bottom)

Proposed denomination: **'3ABIA1619'**
Application number: 21-10493
Application date: 2021/05/03
Applicant: Agrigenetics, Inc., Indianapolis, Indiana, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Steve Plehn, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH18KW'

Summary: *Including the tassel, the plants of '3ABIA1619' are taller than those of 'PH18KW'. The angle between the leaf blade and the stem of '3ABIA1619' is a medium size whereas that for 'PH18KW' is very small. The leaf blade just above the upper ear of '3ABIA1619' is narrower than that of 'PH18KW'. In the middle third of the main branch of the tassel, the anthers of '3ABIA1619' have absent or very weak intensity of anthocyanin colouration whereas those of 'PH18KW' have medium intensity of anthocyanin colouration. The angle between the main axis and the lateral branches of the tassel for '3ABIA1619' is large whereas for 'PH18KW' it is very small. The lateral branches of the tassel for '3ABIA1619' are strongly recurved whereas those for 'PH18KW' are slightly recurved. The main axis above the lowest and highest lateral branch on the tassel for '3ABIA1619' is short whereas that for 'PH18KW' is long. The kernels for '3ABIA1619' are dent type whereas those for 'PH18KW' are intermediate type. The glumes of the cob of '3ABIA1619' have a strong intensity of anthocyanin colouration whereas those of 'PH18KW' have absent or very weak intensity of anthocyanin colouration. The plants of '3ABIA1619' have a low percentage of tillering whereas for the plants of 'PH18KW' tillering is absent.*

Description:
PLANT: inbred yellow variety, small ratio for height of upper ear peduncle insertion to plant height, anthesis and silk emergence occur mid season

STEM: absent or very slight degree of zig-zag, strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, medium sized angle with stem, slightly recurved

TASSEL: medium number of primary lateral branches, medium density of spikelets on middle third of main branch, short main axis above lowest and highest lateral branch
LATERAL BRANCHES: strongly recurved, large angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: medium intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, strong intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, medium length
KERNEL: dent type, yellow on top, orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: '3ABIA1619' was developed by Agrigenetics, Inc. using a pedigree method of plant breeding. In 2006, a cross was conducted between proprietary inbred lines in Arlington, Wisconsin, USA. Selected F1 ears were selfed with subsequent ear to row selections conducted from the F2 to F6 generations with final selections conducted in 2010. '3ABIA1619' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The F8 seed was bulked as breeder seed in Arlington, Washington, USA in 2011.

Tests and Trials: The comparative trial for '3ABIA1619' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000304, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for '3ABIA1619'

	'3ABIA1619'	**'PH18KW'***
Plant height (metres)		
mean	2.22	2.04
std. deviation	0.05	0.08
Leaf blade width (cm)		
mean	9.31	9.80
std. deviation	0.65	0.63

*reference variety

Corn: '3ABIA1619' (left) with reference variety 'PH18KW' (right)

Corn: '3ABIA1619' (top) with reference variety 'PH18KW' (bottom)

Proposed denomination: **'3ZBJL3942'**
Application number: 21-10494
Application date: 2021/05/03
Applicant: Agrigenetics, Inc., Indianapolis, Indiana, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Stipe Vujevic, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH17BT'

Summary: *Anthesis and silk emergence for the plants of '3ZBJL3942' occurs mid season whereas for 'PH17BT' they occur very late. Including the tassels, the plants of '3ZNJL3942' are shorter than those of 'PH17BT'. The leaf blade just above the*

upper ear of '3ZBJL3942' is narrower than that of 'PH17BT'. In the middle third of the main branch of the tassel, the anthers of '3ZBJL3942' have medium intensity of anthocyanin colouration whereas those of 'PH17BT' have absent or very weak intensity of anthocyanin colouration. The angle between the main axis and the lateral branches of the tassel of '3ZBJL3942' is large whereas for 'PH17BT' it is very small. The lateral branches of the tassel of '3ZBJL3942' are strongly recurved whereas those of 'PH17BT' are straight. The ear of '3ZBJL3942' is longer than that of 'PH17BT'. Including the kernels, the ear of '3ZBJL3942' has a smaller diameter than that of 'PH17BT'. The silks of '3ZBJL3942' have very strong intensity of anthocyanin colouration whereas those of 'PH17BT' have medium intensity of anthocyanin colouration.

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis and silk emergence occur mid season

STEM: absent or very slight degree of zig-zag, strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, small angle with stem, slightly recurved

TASSEL: medium number of primary lateral branches, medium density of spikelets on middle third of main branch, short main axes above lowest and highest lateral branches
LATERAL BRANCHES: strongly recurved, large angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): medium intensity of anthocyanin colouration

EAR: very strong intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: none
KERNEL: dent-like type, yellow on top, yellow orange on dorsal side

TILLERING: none

Origin and Breeding: '3ZBJL3942' was developed by Agrigenetics, Inc. using a pedigree method of plant breeding. In 2007, a three-way cross was conducted between proprietary inbred lines in St. Mary`s, Ontario, Canada. Selected F1 ears were selfed with subsequent ear to row selections conducted from the F2 to F4 generations with final selections conducted in 2011. '3ZBJL3942' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The F5 seed was bulked as breeder seed in St. Marys, Ontario, Canada in 2012.

Tests and Trials: The comparative trial for '3ZBJL3942' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 20 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000305, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for '3ZBJL3942'

	'3ZBJL3942'	**'PH17BT'***
Plant height (metres)		
mean	2.33	2.61
std. deviation	0.07	0.09
Leaf blade width (cm)		
mean	7.72	11.91
std. deviation	0.68	1.11
Ear length (cm)		
mean	17.69	15.43
std. deviation	1.00	1.84

Ear diameter (including kernels) (cm)		
mean	3.88	4.16
std. deviation	0.19	0.28

*reference variety

Corn: '3ZBJL3942' (left) with reference variety 'PH17BT' (right)

Corn: '3ZBJL3942' (top) with reference variety 'PH17BT' (bottom)

Proposed denomination: **'PH2D58'**
Application number: 20-10270
Application date: 2020/06/24
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Gary Henke, Pioneer Hi-Bred International, Inc., Miami, Missouri, United States of America

Variety used for comparison: 'PH18G5'

Summary: *Anthesis for the plants of 'PH2D58' occurs very late in the season whereas that for 'PH18G5' occurs late in the season. The leaf blade just above the upper ear of 'PH2D58' is wider than that of 'PH18G5'. The apex and middle of the glumes on the tassel of 'PH2D58' have absent or very weak intensity of anthocyanin colouration whereas those of 'PH18G5' have a medium intensity of anthocyanin colouration. In the middle third of the main branch of the tassel, the anthers of 'PH2D58' have strong intensity of anthocyanin colouration whereas those of 'PH18G5' have a medium intensity of anthocyanin colouration. The angle between the main axis and the lateral branches of the tassel for 'PH2D58' is small whereas that for 'PH18G5' is medium sized. The tassel of 'PH2D58' has absent or very few primary lateral branches whereas that of 'PH18G5' has few primary lateral branches. The main axes above the lowest and highest lateral branches of the tassel of 'PH2D58' is of a medium length whereas those of 'PH18G5' are very long.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs very late in season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, very strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, small angle with stem, straight

TASSEL: absent or very few primary lateral branches, medium density of spikelets on middle third of main branch, medium length main axes above lowest lateral and highest lateral branches
LATERAL BRANCHES: straight, small angle with main axis
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): strong intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, long husk (extends one third length of ear above tip), conico-cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, medium length
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: none

Origin and Breeding: 'PH2D58' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2008, a cross was conducted between proprietary inbred lines in Salinas, Puerto Rico. The F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2009, selected D1 lines were self pollinated and harvested in bulk. In 2011, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH2D58' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Puerto Vallarta, Mexico in 2011.

Tests and Trials: The comparative trial for 'PH2D58' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 28 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 201800236, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH2D58'

	'PH2D58'	'PH18G5'*
Leaf blade width (cm)		
mean	9.85	8.72
std. deviation	0.74	0.56

*reference variety

Corn: 'PH2D58' (left) with reference variety 'PH18G5' (right)

Corn: 'PH2D58' (top) with reference variety 'PH18G5' (bottom)

Proposed denomination: **'PH2RRS'**
Application number: 20-10167
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Eric Riedeman, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH18JA'

Summary: *Anthesis for the plants of 'PH2RRS' occurs mid season whereas that for 'PH18JA' occurs late in the season. Including the tassel, the plants of 'PH2RRS' are taller than those of 'PH18JA'. The brace roots of 'PH2RRS' have a weak intensity of anthocyanin colouration whereas those of 'PH18JA' have strong anthocyanin colouration. The leaf blade just above the upper ear of 'PH2RRS' is narrower than that of 'PH18JA'. The leaf blade of 'PH2RRS' has a medium degree of undulation of the margin whereas that of 'PH18JA' has strong undulation of the margin. The tassels of 'PH2RRS' have many primary lateral branches whereas those of 'PH18JA' have a medium number of primary lateral branches. The angle between the main axis and the lateral branches for 'PH2RRS' is small whereas that for 'PH18JA' is a medium size. Including the kernels, the ear of 'PH2RRS' has a smaller diameter than that of 'PH18JA'. The glumes on the cob of 'PH2RRS' have a weak intensity of anthocyanin colouration whereas those of 'PH18JA' have a medium intensity of anthocyanin colouration.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs mid season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, small angle with stem, slightly recurved

TASSEL: many primary lateral branches, medium density of spikelets on middle third of main branch, medium length main axis above lowest lateral branch, short main axis above highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, long
KERNEL: dent type, yellow on top, yellow orange on dorsal side

TILLERING: none

Origin and Breeding: 'PH2RRS' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2008, a cross was conducted between proprietary inbred lines in Mankato, Minnesota, USA. In 2009, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2010, selected D1 lines were self pollinated and harvested in bulk. In 2012, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH2RRS' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Algona, Iowa, USA in 2013.

Tests and Trials: The comparative trial for 'PH2RRS' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5%

probability level based on Student's T-tests. Results were supported by the official technical examination report 201800265, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH2RRS'

	'PH2RRS'	'PH18JA'*
Plant height (metres)		
mean	2.15	2.00
std. deviation	0.06	0.09
Leaf blade width (cm)		
mean	8.58	9.57
std. deviation	0.69	0.70
Ear diameter (cm)		
mean	4.08	4.49
std. deviation	0.17	0.23

*reference variety

Corn: 'PH2RRS' (top) with reference variety 'PH18JA' (bottom)

Proposed denomination: **'PH40SW'**
Application number: 21-10496
Application date: 2021/05/03
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Maria Faricelli, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Kurt Olmar, Pioneer Hi-Bred International, Inc., Dallas Center, Iowa, United States of America

Variety used for comparison: 'PH1K0H1'

Summary: *The brace roots on the stems of 'PH40SW' have a strong intensity of anthocyanin colouration whereas those of 'PH1K0H1' have very strong intensity of anthocyanin colouration. The tassel of 'PH40SW' have moderately sparse density*

of spikelets whereas that of 'PH1K0H1' have a medium density of spikelets. The main axis above the lowest lateral branch on the tassel of 'PH40SW' is a medium length whereas that of 'PH1K0H1' is long. The lateral branch on the tassel of 'PH40SW' is short whereas that of 'PH1K0H1' is a medium length. The husk covering the tip of the ear of 'PH40SW' is a medium length whereas that of 'PH1K0H1' is long. The ear wings for 'PH40SW' are present on a high percentage of plants whereas those of 'PH1K0H1' are present on a low percentage of plants. Including the kernels, the ear of 'PH40SW' has a larger diameter than that of 'PH1K0H1'. The ear of 'PH40SW' has many rows of kernels whereas that of 'PH1K0H1' has a medium number of rows of kernels. The glumes of the cob of 'PH40SW' have medium intensity of anthocyanin colouration whereas those of 'PH1K0H1' have weak intensity of anthocyanin colouration.

Description:
PLANT: inbred yellow variety, small ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs very late in season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, small angle with stem, slightly recurved

TASSEL: few primary lateral branches, moderately sparse spikelets on middle third of main branch, medium length main axis above lowest lateral branch, long main axis above highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, short
GLUME: absent or very weak intensity of anthocyanin colouration at base, medium intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): weak intensity of anthocyanin colouration

EAR: weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), cylindrical shape, many rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, medium length
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: present on a medium percentage of plants

Origin and Breeding: 'PH40SW' was developed by Pioneer Hi-Bred International, Inc. using a pedigree method of plant breeding. In 2011, a cross was conducted between proprietary inbred lines in Salinas, Puerto Rico with a subsequent backcross to the motherline. The BCF1 generation was selfed with subsequent ear to row selections conducted from the BCF1 to BCF6 generations. 'PH40SW' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The BCF7 seed was bulked as breeder seed in New Holland, Pennsylvania, USA in 2015.

Tests and Trials: The comparative trial for 'PH40SW' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 27 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000313, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH40SW'

	'PH40SW'	**'PH1K0H1'***
Ear diameter (including kernels) (cm)		
mean	4.43	4.19
std. deviation	0.19	0.26

*reference variety

Corn: 'PH40SW' (left) with reference variety 'PH1K0H1' (right)

Corn: 'PH40SW' (top) with reference variety 'PH1K0H1' (bottom)

Proposed denomination: **'PH41F0'**
Application number: 21-10497
Application date: 2021/05/03
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Travis Lee, Pioneer Hi-Bred International, Inc., Garden City, Kansas, United States of America

Variety used for comparison: 'PH1CJB'

Summary: *Including the tassel, the plants of 'PH41F0' are shorter than those of 'PH1CJB'. The leaf blade just above the upper ear of 'PH41F0' is wider than that of 'PH1CJB'. The leaf blade of 'PH41F0' has a medium degree of undulation of*

the margin whereas the leaf blade of 'PH1CJB' has absent or very weak undulation of the margin. The tassel of 'PH41F0' has a medium density of spikelets whereas that of 'PH1CJB' has moderately sparse spikelets. In the middle third of the main branch of the tassel, the anthers of 'PH41F0' have strong intensity of anthocyanin colouration whereas those of 'PH1CJB' have a weak intensity of anthocyanin colouration. The ear wings for 'PH41F0' are present on a low percentage of plant whereas for 'PH1CJB' they are present on a high percentage of plants. The glumes of the cob of 'PH41F0' have a medium intensity of anthocyanin colouration whereas those of 'PH1CJB' have weak intensity of anthocyanin colouration.

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs very late in season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, straight

TASSEL: absent or very few primary lateral branches, medium density of spikelets on middle third of main branch, long main axis
LATERAL BRANCHES: none
GLUME: absent or very weak intensity of anthocyanin colouration throughout
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): strong intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, short
KERNEL: dent-like type, yellow on top, yellow orange on dorsal side

TILLERING: none

Origin and Breeding: 'PH41F0' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2010, the F1 generation underwent the haploidization process with subsequent chromosome doubling and selfing. In 2011, selected D1 lines were self pollinated and harvested in bulk. In 2013 and 2014, the D2 and D3 lines were self-pollinated with subsequent ear selections, respectively. 'PH41F0' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Garden City, Kansas, USA, in 2015.

Tests and Trials: The comparative trial for 'PH41F0' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 29 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 201900143, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH41F0'

	'PH41F0'	**'PH1CJB'***
Plant height (metres)		
mean	2.14	2.32
std. deviation	0.09	0.07
Leaf blade width (cm)		
mean	9.15	8.45
std. deviation	0.56	0.59

*reference variety

Corn: 'PH41F0' (left) with reference variety 'PH1CJB' (right)

Corn: 'PH41F0' (top) with reference variety 'PH1CJB' (bottom)

Proposed denomination: **'PH41M2'**
Application number: 20-10168
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Mario Carlone, Pioneer Hi-Bred International, Inc., Princeton, Illinois, United States of America

Variety used for comparison: 'PH17R8'

Summary: *Including the tassel, the plants of 'PH41M2' are shorter than those of 'PH17R8'. The tassels of 'PH41M2' have many primary lateral branches whereas those of 'PH17R8' have few primary lateral branches. The main axis above the highest lateral branch of 'PH41M2' is short whereas that of 'PH17R8' is a medium length. The ear of 'PH41M2' is shorter than that of 'PH17R8'. The glumes on the cobs of 'PH41M2' have a weak intensity of anthocyanin colouration whereas those of 'PH17R8' have a medium intensity of anthocyanin colouration.*

Description:
PLANT: inbred yellow variety, small ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs very late in season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, very strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, very small angle with stem, straight
TASSEL: many primary lateral branches, medium density of spikelets on middle third of main branch, medium length main axis above lowest lateral branch, short main axis above highest lateral branch
LATERAL BRANCHES: straight, very small angle with main axis, long
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, few rows of grain, weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, medium length
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: none

Origin and Breeding: 'PH41M2' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in Miami, Missouri, USA. In 2010, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2011, selected D1 lines were self pollinated and harvested in bulk. In 2013, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH41M2' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Puerto Vallarta, Mexico in 2014.

Tests and Trials: The comparative trial for 'PH41M2' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 29 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 201900147, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH41M2'

	'PH41M2'	**'PH17R8'***
Plant height (metres)		
mean	1.99	2.19
std. deviation	0.06	0.09
Ear length (cm)		
mean	16.04	17.54
std. deviation	1.16	0.91

*reference variety

Corn: 'PH41M2' (top) with reference variety 'PH17R8' (bottom)

Proposed denomination: **'PH41VW'**
Application number: 20-10169
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Michael P. Jines, Pioneer Hi-Bred International, Inc., Windfall, Indiana, United States of America

Leah Stirling, Pioneer Hi-Bred International, Inc., Janesville, Wisconsin, United States of America

Variety used for comparison: 'PH1D84'

Summary: *Anthesis for the plants of 'PH41VW' occurs very late in the season whereas that for 'PH1D84' occurs late in the season. Including the tassel, the plants of 'PH41VW' are taller than those of 'PH1D84'. The leaf blade just above the upper ear of 'PH41VW' is wider than that of 'PH1D84'. The middle and apex of the glumes on the tassel of 'PH41VW' have an absent or very weak intensity of anthocyanin colouration whereas those of 'PH1D84' have a weak intensity of anthocyanin colouration. In the middle third of the main branch of the tassel, the anthers of 'PH41VW' have a strong intensity of anthocyanin colouration whereas those of 'PH1D84' have a medium intensity of anthocyanin colouration. The tassels of 'PH41VW' have absent or very few primary lateral branches whereas those of 'PH1D84' have few primary lateral branches. The angle between the main axis and the lateral branches for 'PH41VW' is very small whereas the angle for 'PH1D84' is small. The primary ear of 'PH41VW' is located higher on the stem than that of 'PH1D84'. The percentage of tillering for the plants of 'PH41VW' is low whereas there is none present for 'PH1D84'.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs very late in season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, very strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, straight

TASSEL: absent or very few primary lateral branches, medium density of spikelets on middle third of main branch, medium length main axis above lowest lateral branch, long main axis above highest lateral branch
LATERAL BRANCHES: straight, very small angle with main axis
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): strong intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, long husk (extends one third length of ear above tip), conico-cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, medium length
KERNEL: intermediate type, yellow on top, orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH41VW' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in New Holland, Pennsylvania, USA. In 2010, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. The variety was advanced from the D1 to D3 generation with the lines being self pollinated and the resulting seed harvested in bulk. 'PH41VW' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Princeton, Illinois, USA in 2012.

Tests and Trials: The comparative trial for 'PH41VW' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 26 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 201900151, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH41VW'

	'PH41VW'	**'PH1D84'***
Plant height (metres)		
mean	2.36	2.14
std. deviation	0.11	0.11
Leaf blade width (cm)		
mean	10.07	8.68
std. deviation	0.59	0.64
Primary ear height (metres)		
mean	0.82	0.65
std. deviation	0.07	0.07

*reference variety

Corn: 'PH41VW' (left) with reference variety 'PH1D84' (right)

Corn: 'PH41VW' (top) with reference variety 'PH1D84' (bottom)

Proposed denomination: **'PH42SH'**
Application number: 20-10170
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Steve Szalma, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH1MBC'

Summary: *Silk emergence for the plants of 'PH42SH' occurs early in the season whereas that for 'PH1MBC' ioccurs mid season. Including the tassel, the plants of 'PH42SH' are shorter than those of 'PH1MBC'. The anthocyanin colouration on*

the brace roots of 'PH42SH' is of a medium intensity whereas the intensity is strong on the brace roots of 'PH1MBC'. The ratio of height of insertion of the peduncle of the upper ear to the plant height for 'PH42SH' is large whereas that for 'PH1MBC' is medium. The angle between the leaf blade and the stem for 'PH42SH' is very small whereas that for 'PH1MBC' is small. The tassel of 'PH42SH' has a medium number of primary lateral branches whereas that of 'PH1MBC' has few primary lateral branches. The angle between the main axis and the lateral branches of the tassel for 'PH42SH' is very small whereas that for 'PH1MBC' is small. The main axis above the lowest lateral branch on the tassel of 'PH42SH' is a medium length whereas that for 'PH1MBC' is long. The lateral branches for 'PH42SH' are short whereas those of 'PH1MBC' are of a medium length. The glumes of the cob of 'PH42SH' have strong intensity of anthocyanin colouration whereas those of 'PH1MBC' have a medium intensity of anthocyanin colouration.

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs mid season, silk emergence occurs early in season

STEM: absent or very slight degree of zig-zag, medium intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, slightly recurved

TASSEL: medium number of primary lateral branches, moderately dense spikelets on middle third of main branch, medium length main axes above lowest lateral and highest lateral branches
LATERAL BRANCHES: straight, very small angle with main axis, short
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, strong intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, medium length
KERNEL: dent type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH42SH' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Willmar, Minnesota USA. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. Selected D1 lines were self pollinated and harvested in bulk. In 2013, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH42SH' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Puerto Vallarta, Mexico in 2014.

Tests and Trials: The comparative trial for 'PH42SH' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000318, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH42SH'

	'PH42SH'	**'PH1MBC'***
Plant height (metres)		
mean	1.97	2.16
std. deviation	0.09	0.08

*reference variety

Corn: 'PH42SH' (left) with reference variety 'PH1MBC' (right)

Corn: 'PH42SH' (top) with reference variety 'PH1MBC' (bottom)

Proposed denomination: **'PH42YR'**
Application number: 20-10171
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Edwin Grote, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Martin Arbelbide, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Julia X. Zhang, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH1MD0'

Summary: *Including the tassel, the plants of 'PH42YR' are taller than those of 'PH1MD0'. The leaf blade just above the upper ear of 'PH42YR' has absent or very weak undulation of the margin whereas that of 'PH1MD0' has a medium degree of undulation. The tassels of 'PH42YR' have few primary lateral branches whereas those of 'PH1MD0' have absent or very few primary lateral branches. The tassels of 'PH42YR' have moderately sparse spikelets whereas those of 'PH1MD0' have a medium density of spikelets. The main axis above the lowest lateral branch of the tassel of 'PH42YR' is of a medium length whereas that of 'PH1MD0' is short. The primary ear of 'PH42YR' is located higher on the stem than that of 'PH1MD0'. The ear of 'PH42YR' is longer than that of 'PH1MD0'. The husk covering the tip of the ear of 'PH42YR' is short whereas that of 'PH1MD0' is a medium length. The ear wings for 'PH42YR' are short and present on a medium percentage of plants whereas those for 'PH1MD0' are a medium length and present on a low percentage of plants.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs mid season, silk emergence occurs early in season

STEM: absent or very slight degree of zig-zag, absent or very weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): absent or very weak undulation of margin, small angle with stem, straight

TASSEL: few primary lateral branches, moderately sparse spikelets on middle third of main branch, short main axis above lowest lateral branch, medium length main axis above highest lateral branch
LATERAL BRANCHES: straight, very small angle with main axis, short
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): medium intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, strong intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, short
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH42YR' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2008, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2009, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2010, selected D1 lines were self pollinated and harvested in bulk. In 2012 and 2013, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH42YR' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Eau Claire, Wisconsin, USA, in 2014.

Tests and Trials: The comparative trial for 'PH42YR' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000319, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH42YR'

	'PH42YR'	**'PH1MD0'***
Plant height (metres)		
mean	2.03	1.96
std. deviation	0.05	0.08

Primary ear height (metres)		
mean	0.66	0.62
std. deviation	0.04	0.09
Ear length (cm)		
mean	16.64	14.43
std. deviation	0.79	0.96

*reference variety

Corn: 'PH42YR' (left) with reference variety 'PH1MD0' (right)

Corn: 'PH42YR' (top) with reference variety 'PH1MD0' (bottom)

Proposed denomination: **'PH47GV'**
Application number: 21-10500
Application date: 2021/05/03
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Suzanne Mickelson, Pioneer Hi-Bred International, Inc., Janesville, Wisconsin, United States of America

Dina Severns, Pioneer Hi-Bred International, Inc., Ithaca, Michigan, United States of America

Variety used for comparison: 'PH1380'

Summary: *Anthesis for the plants of 'PH47GV' occurs mid season whereas that for 'PH1380' occurs late in the season. Including the tassel, the plants of 'PH47GV' are shorter than those of 'PH1380'. The ratio of height of insertion of the peduncle of the upper ear to the plant height for 'PH47GV' is medium whereas that for 'PH1380' is large. The leaf blade just above the upper ear of 'PH47GV' is narrower than that of 'PH1380'. The main axis above the lowest lateral branch on the tassel of 'PH47GV' is short whereas for 'PH1380' it is a medium length. The main axis above the highest lateral branch on the tassel of 'PH47GV' is a medium length whereas that for 'PH1380' is short. The tassels of 'PH47GV' have few primary lateral branches whereas those of 'PH1380' have a medium number of primary lateral branches. The apex and middle of the glumes on the tassel of 'PH47GV' have a medium intensity of anthocyanin colouration whereas those of 'PH1380' have a strong intensity of anthocyanin colouration. The primary ear of 'PH47GV' is located lower on the stem than that of 'PH1380'. Including the kernels, the ear of 'PH47GV' has a smaller diameter than that of 'PH1380'. The silks of 'PH47GV' have a strong intensity of anthocyanin colouration whereas the silks of 'PH1380' have a medium intensity of anthocyanin colouration.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis and silk emergence occur mid season

STEM: absent or very slight degree of zig-zag, medium intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, small angle with stem, slightly recurved

TASSEL: few primary lateral branches, medium density of spikelets on middle third of main branch, short main axis above lowest lateral branch, medium length main axis above highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, short
GLUME: absent or very weak intensity of anthocyanin colouration at base, medium intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: strong intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, medium length
KERNEL: flint-like type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH47GV' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Buin, Chile. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2012, selected D1 lines were self pollinated and harvested in bulk. From 2012 to 2014, the D2 to D4 lines were self pollinated with subsequent ear selections, respectively. 'PH47GV'' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D6 seed was bulked as breeder seed in Janesville, Wisconsin, USA in 2015.

Tests and Trials: The comparative trial for 'PH47GV' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000328, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH47GV'

	'PH47GV'	**'PH1380'***
Plant height (metres)		
mean	1.84	2.19
std. deviation	0.08	0.09
Leaf blade width (cm)		
mean	7.69	10.04
std. deviation	0.44	0.70
Primary ear height (metres)		
mean	0.57	0.84
std. deviation	0.09	0.12
Ear diameter (including kernels) (cm)		
mean	3.91	4.81
std. deviation	0.26	0.13

*reference variety

Corn: 'PH47GV' (left) with reference variety 'PH1380' (right)

Corn: 'PH47GV' (top) with reference variety 'PH1380' (bottom)

Proposed denomination: **'PH47KB'**
Application number: 20-10172
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Polly S Longenberger, Pioneer Hi-Bred International, Inc., New Holland, Pennsylvania, United States of America

Variety used for comparison: 'PH18G5'

Summary: *Silk emergence for the plants of 'PH47KB' occurs mid season whereas that for 'PH18G5' occurs late in the season. Including the tassel, the plants of 'PH47KB' are taller than those of 'PH18G5'. The leaf bladejust above the upper ear of 'PH47KB' has strong undulation of the margin whereas that of 'PH18G5' has a medium degree of undulation of the margin. The angle between the leaf blade and the stem for 'PH47KB' is very small whereas that for 'PH18G5' is small. The tassels of 'PH47KB' have moderately sparse spikelets whereas those of 'PH18G5' have a medium density of spikelets. The apex and middle of the glumes on the tassel of 'PH47KB' have a strong intensity of anthocyanin colouration whereas those of 'PH18G5' have a medium intensity of anthocyanin colouration.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs late in season, silk emergence occurs mid season

STEM: absent or very slight degree of zig-zag, very strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, very small angle with stem, straight

TASSEL: few primary lateral branches, moderately sparse spikelets on middle third of main branch, very long main axis above lowest lateral branch and highest lateral branch
LATERAL BRANCHES: slightly recurved, medium sized angle with main axis, long
GLUME: absent or very weak intensity of anthocyanin colouration at base, strong intensity of anthocyanin colouration at apex and middle

ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): medium intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, long husk (extends one third length of ear above tip), conico-cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, medium length
KERNEL: dent-like type, yellow on top, yellow orange on dorsal side

TILLERING: none

Origin and Breeding: 'PH47KB' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Salinas, Puerto Rico. In 2011, the resulting F1 was selfed and bulk harvested. The F2 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2012, selected D1 lines were self pollinated and harvested in bulk. In 2014, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH47KB' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in New Holland, Pennsylvania, USA in 2015.

Tests and Trials: The comparative trial for 'PH47KB' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000329, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH47KB'

	'PH47KB'	**'PH18G5'***
Plant height (metres)		
mean	2.25	2.15
std. deviation	0.01	0.01

*reference variety

Corn: 'PH47KB' (left) with reference variety 'PH18G5' (right)

Corn: 'PH47KB' (top) with reference variety 'PH18G5' (bottom)

Proposed denomination: **'PH47R1'**
Application number: 20-10173
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Mario Carlone, Pioneer Hi-Bred International, Inc., Princeton, Illinois, United States of America

Variety used for comparison: 'PH1V5T'

Summary: *The brace roots of 'PH47R1' have a strong intensity of anthocyanin colouration whereas those of 'PH1V5T' have a weak intensity of anthocyanin colouration. The leaf blade just above the upper ear of 'PH47R1' is narrower than that of 'PH1V5T'. The angle between the main axis and the lateral branches on the tassel of 'PH47R1' is a medium size whereas that of 'PH1V5T' is small. The tassels of 'PH47R1' have a medium number of primary lateral branches whereas those of 'PH1V5T' have many primary lateral branches. The tassels of 'PH47R1' have a medium density of spikelets whereas those of 'PH1V5T' are moderately dense with spikelets. The main axis above the lowest lateral branch of the tassel of 'PH47R1' is very short whereas that for 'PH1V5T' is long. The main axis above the highest lateral branch of the tassel of 'PH47R1' is very short whereas that for 'PH1V5T' is a medium length. The lateral branches of the tassel of 'PH47R1' are a medium length whereas those of 'PH1V5T' are long. The ear of 'PH47R1' is shorter than that of 'PH1V5T'.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs very late in season, silk emergence occurs late in season

STEM: absent or very slight degree of zig-zag, strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, medium sized angle with stem, slightly recurved

TASSEL: medium number of primary lateral branches, medium density of spikelets on middle third of main branch, very short main axes above lowest lateral and highest lateral branches
LATERAL BRANCHES: straight, medium sized angle with main axis, medium length

GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: weak intensity of anthocyanin colouration of silks, long husk (extends one third length of ear above tip), conico-cylindrical shape, many rows of grain, weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: absent
KERNEL: dent type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH47R1' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2012, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2013, selected D1 lines were self pollinated and harvested in bulk. In 2013 and 2014, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH47R1' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Princeton, Illinois, USA in 2015.

Tests and Trials: The comparative trial for 'PH47R1' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 29 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000330, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH47R1'

	'PH47R1'	**'PH1V5T'***
Leaf blade width (cm)		
mean	10.45	11.28
std. deviation	0.58	0.53
Ear length (cm)		
mean	13.51	15.69
std. deviation	0.84	1.06

*reference variety

Corn: 'PH47R1' (left) with reference variety 'PH1V5T' (right)

Corn: 'PH47R1' (top) with reference variety 'PH1V5T' (bottom)

Proposed denomination: **'PH48AR'**
Application number: 21-10501
Application date: 2021/05/03
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Joseph Gogerty, Pioneer Hi-Bred International, Inc., Johnston, Idaho, United States of America

Variety used for comparison: 'PH18G5'

Summary: *Silk emergence for the plants of 'PH48AR' occurs mid season whereas that for the plants of 'PH18G5' occurs late in the season. The ratio of height of insertion of the peduncle of the upper ear to the plant height for 'PH48AR' is large*

whereas for 'PH18G5' the ratio is medium. The leaf blade just above the upper ear of 'PH48AR' is wider than that of 'PH18G5'. In the middle third of the main branch of the tassel, the anthers of 'PH48AR' have a strong intensity of anthocyanin colouration whereas those of 'PH18G5' have a medium intensity of anthocyanin colouration. The apex and middle of the glumes on the tassel of 'PH48AR' have a weak intensity of anthocyanin colouration whereas those of 'PH18G5' have a medium intensity of anthocyanin colouration. The ear of 'PH48AR' is longer than that of 'PH18G5'. The plants of 'PH48AR' have a low percentage of tillering whereas for the plants of 'PH18G5' tillering is absent.

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs late in season, silk emergence occurs mid season

STEM: absent or very slight degree of zig-zag, very strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, straight

TASSEL: few primary lateral branches, moderately sparse spikelets on middle third of main branch, long main axis above lowest and highest lateral branch
LATERAL BRANCHES: straight, medium sized angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): strong intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, short
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48AR' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2012, a cross was conducted between proprietary inbred lines in Marion, Iowa, USA. The F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2013, selected DH1 lines were self pollinated and harvested in bulk. From 2014 to 2015, the DH2 to DH4 lines were self pollinated with subsequent ear selections, respectively. 'PH48AR' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D6 seed was bulked as breeder seed in Puerto Vallarta, Mexico in 2017.

Tests and Trials: The comparative trial for 'PH48AR'was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000335, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48AR'

	'PH48AR'	**'PH18G5'***
Leaf blade width (cm)		
mean	10.33	8.64
std. deviation	0.55	0.64
Ear length (cm)		
mean	16.83	15.81
std. deviation	0.71	1.13

*reference variety

Corn: 'PH48AR' (left) with reference variety 'PH18G5' (right)

Corn: 'PH48AR' (top) with reference variety 'PH18G5' (bottom)

Proposed denomination: **'PH48C4'**
Application number: 21-10502
Application date: 2021/05/03
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Jay Hotchkiss, Pioneer Hi-Bred International, Inc., Brookings, South Dakota, United States of America

Gary Weber, Pioneer Hi-Bred International, Inc., Sioux Falls, South Dakota, United States of America

Variety used for comparison: 'PH1MDJ'

Summary: *Anthesis for the plants of 'PH48C4' occurs early in the season whereas that for the plants of 'PH1MDJ' occurs mid season. Silk emergence for the plants of 'PH48C4' occurs very early in the season whereas that for the plants of 'PH1MDJ' occurs early in the season. Including the tassel, the plants of 'PH48C4' are taller than those of 'PH1MDJ'. The ratio of height of insertion of the peduncle of the upper ear to the plant height for 'PH48C4' is large whereas that for 'PH1MDJ' is small. The leaf blade just above the upper ear of 'PH48C4' is wider than that of 'PH1MDJ'. In the middle third of the main branch of the tassel, the anthers of 'PH48C4' have a weak intensity of anthocyanin colouration whereas those for 'PH1MDJ' have a strong intensity of anthocyanin colouration. The primary ear of 'PH48C4' is located higher on the stem than that of 'PH1MDJ'. The silks of 'PH48C4' have an absent or very weak intensity of anthocyanin colouration whereas the silks of 'PH1MDJ' have a weak intensity of anthocyanin colouration. The ear wings for 'PH48C4' are a medium length and present on a low percentage of plants whereas for 'PH1MDJ' ear wings are absent.*

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs early in season, silk emergence occurs very early in season

STEM: absent or very slight degree of zig-zag, weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, straight

TASSEL: medium number of primary lateral branches, moderately sparse spikelets on middle third of main branch, medium length main axis above lowest and highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, medium length
KERNEL: dent-like type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48C4' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2008, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2009, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2010, selected D1 lines were self pollinated and harvested in bulk. From 2013 to 2015, the D2 to D6 lines were self pollinated with subsequent ear selections, respectively. 'PH48C4' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D8 seed was bulked as breeder seed in Arica, Chile in 2016.

Tests and Trials: The comparative trial for 'PH48C4' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000338, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48C4'

	'PH48C4'	**'PH1MDJ'***
Plant height (metres)		
mean	2.09	1.85
std. deviation	0.08	0.07

Leaf blade width (cm)		
mean	9.18	8.13
std. deviation	0.52	0.48
Primary ear height (metres)		
mean	0.75	0.55
std. deviation	0.06	0.07

*reference variety

Corn: 'PH48C4' (left) with reference variety 'PH1MDJ' (right)

Corn: 'PH48C4' (top) with reference variety 'PH1MDJ' (bottom)

Proposed denomination: **'PH48G8'**
Application number: 21-10503
Application date: 2021/05/03
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Martin A. Fabrizius, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Steve Szalma, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH18KW'

Summary: *Anthesis for the plants of 'PH48G8' occurs mid season whereas that for 'PH18KW' occurs late in the season. The silks of 'PH48G8' emerge early in the season whereas those for 'PH18KW' emerge mid season. Including the tassel, the plants of 'PH48G8' are shorter than those of 'PH18KW'. The tassels of 'PH48G8' have a medium density of spikelets whereas those of 'PH18KW' have moderately sparse spikelets. The lateral branches of the tassel of 'PH48G8' are straight whereas those of 'PH18KW' are slightly recurved. The primary ear of 'PH48G8' is located lower on the stem than that of 'PH18KW'. The ear of 'PH48G8' is shorter than that of 'PH18KW'. The ear wings for 'PH48G8' are present on a low percentage of plants whereas for 'PH18KW' ear wings are absent. The plants of 'PH48G8' have a low percentage of tillering whereas for 'PH18KW' tillering is absent.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle upper ear to plant height, anthesis occurs mid season, silk emergence occurs early in season

STEM: absent or very slight degree of zig-zag, medium intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, straight

TASSEL: few primary lateral branches, medium density of spikelets on middle third of main branch, medium length main axis above lowest lateral branch, long main axis above highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): medium intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, short
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48G8' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2008, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2009, the F2 generation underwent a haploidization process with subsequent chromosome doubling and selfing. Selected D1 lines were self pollinated and harvested in bulk. From 2014 to 2016, the D2 to D5 lines were self pollinated with subsequent ear selections, respectively. 'PH48G8' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The DH7 seed was bulked as breeder seed in Olivia, Minnesota, USA in 2018.

Tests and Trials: The comparative trial for 'PH48G8' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000340, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48G8'

	'PH48G8'	'PH18KW'*
Plant height (metres)		
mean	1.99	2.10
std. deviation	0.06	0.08
Primary ear height (metres)		
mean	0.62	0.70
std. deviation	0.09	0.05
Ear length (cm)		
mean	14.59	15.40
std. deviation	0.92	1.03

*reference variety

Corn: 'PH48G8' (left) with reference variety 'PH18KW' (right)

Corn: 'PH48G8' (top) with reference variety 'PH18KW' (bottom)

Proposed denomination: **'PH48JH'**
Application number: 20-10174
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Edwin Grote, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Andrew Ross, Pioneer Hi-Bred International, Inc., Marion, Iowa, United States of America

Variety used for comparison: 'PH18G5'

Summary: *Anthesis for the plants of 'PH48JH' occurs mid season whereas that for 'PH18G5' occurs late in the season. Silk emergence for the plants of 'PH48JH' occurs early in the season whereas that for 'PH18G5' occurs mid season. Including the tassel, the plants of 'PH48JH' are shorter than those of 'PH18G5'. The leaf blade just above the upper ear of 'PH48JH' is wider than that of 'PH18G5'. The angle between the main axis and the lateral branches of the tassel of 'PH48JH' is small whereas that of 'PH18G5' is a medium size. The ear of 'PH48JH' is longer, and including the kernels, has a smaller diameter than that of 'PH18G5'. The plants of 'PH48JH' have a low percentage of tillering whereas for the plants of 'PH18G5' tillering is absent.*

Description:
PLANT: inbred yellow variety, small ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs mid season, silk emergence occurs early in season

STEM: absent or very slight degree of zig-zag, strong intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, very small angle with stem, slightly recurved

TASSEL: few primary lateral branches, medium density of spikelets on middle third of main branch, very long main axis above lowest lateral branch and highest lateral branch
LATERAL BRANCHES: slightly recurved, small angle with main axis, long
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): weak intensity of anthocyanin colouration

EAR: weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, absent or very weak intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, medium length
KERNEL: intermediate type, yellow on top, orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48JH' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2010, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2011, selected D1 lines were self pollinated and harvested in bulk. In 2012 and 2014, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH48JH' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Marion, Iowa, USA in 2015.

Tests and Trials: The comparative trial for 'PH48JH' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 29 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000342, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48JH'

	'PH48JH'	'PH18G5'*
Plant height (metres)		
mean	2.06	2.13
std. deviation	0.06	0.09
Leaf blade width (cm)		
mean	9.07	8.72
std. deviation	0.46	0.47
Ear length (cm)		
mean	17.24	15.71
std. deviation	1.05	1.29
Ear diameter (including kernels) (cm)		
mean	4.07	4.23
std. deviation	0.15	0.14

*reference variety

Corn: 'PH48JH' (left) with reference variety 'PH18G5' (right)

Corn: 'PH48JH' (top) with reference variety 'PH18G5' (bottom)

Proposed denomination: **'PH48KC'**
Application number: 20-10271
Application date: 2020/06/24
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Christopher M. Schaefer, Pioneer Hi-Bred International, Inc., Volga, South Dakota, United States of America

Variety used for comparison: 'PH1MB5'

Summary: *The leaf blade just above the upper ear of 'PH48KC' is narrower than that of 'PH1MB5'. The main axis above the lowest lateral branch on the tassel of 'PH48KC' is long whereas for 'PH1MB5' it is very long. The main axis above the highest lateral branch on the tassel of 'PH48KC' is a medium length whereas that for 'PH1MB5' is long. The tassels of 'PH48KC' have a medium density of spikelets whereas those of 'PH1MB5' are moderately dense with spikelets. The tassels of 'PH48KC' have many primary lateral branches whereas those of 'PH1MB5' have a medium number of primary lateral branches. Including the kernels, the ear of 'PH48KC' has a smaller diameter than that of 'PH1MB5'.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis and silk emergence occur mid season

STEM: absent or very slight degree of zig-zag, absent or very weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, small angle with stem, slightly recurved

TASSEL: many primary lateral branches, medium density of spikelets on middle third of main branch, long main axis above lowest lateral branch, medium length main axis above highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration throughout

ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, long
KERNEL: dent type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48KC' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Willmar, Minnesota, USA. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2012, selected D1 lines were self pollinated and harvested in bulk. In 2014, the D2 and D3 lines were self pollinated with subsequent ear selections respectively. 'PH48KC' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Brookings, South Dakota, USA in 2015.

Tests and Trials: The comparative trial for 'PH48KC' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000343, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48KC'

	'PH48KC'	**'PH1MB5'***
Leaf blade width (cm)		
mean	8.46	8.97
std. deviation	0.65	0.67
Ear diameter (including kernels) (cm)		
mean	4.10	4.63
std. deviation	0.21	0.11

*reference variety

Corn: 'PH48KC' (left) with reference variety 'PH1MB5' (right)

Corn: 'PH48KC' (top) with reference variety 'PH1MB5' (bottom)

Proposed denomination: **'PH48PW'**
Application number: 20-10175
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Michael Chandler, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH25KM'

Summary: *Anthesis for the plants of 'PH48PW' occurs mid season whereas that for 'PH25KM' occurs late in the season. Silk emergence for the plants of 'PH48PW' occurs early in the season whereas that for 'PH25KM' occurs late in the season. The brace roots of 'PH48PW' have a medium intensity of anthocyanin colouration whereas those for 'PH25KM' have an absent or very weak intensity of anthocyanin colouration. The leaf blade just above the upper ear of 'PH48PW' is narrower than that of 'PH25KM'. The primary ear of 'PH48PW' is located lower on the stem than that for 'PH25KM'. The ear of 'PH48PW' is longer, and including the kernels, has a smaller diameter than that of 'PH25KM'. The husk covering the tip of the ear of 'PH48PW' is short whereas that of 'PH25KM' is long. The plants of 'PH48PW' have a low percentage of tillering whereas for the plants of 'PH25KM' tillering is absent.*

Description:
PLANT: inbred yellow variety, small ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs mid season, silk emergence occurs early in season

STEM: absent or very slight degree of zig-zag, medium intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, small angle with stem, slightly recurved

TASSEL: absent or very few primary lateral branches, moderately sparse spikelets on middle third of main branch, very long main axis
LATERAL BRANCHES: none

GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): medium intensity of anthocyanin colouration

EAR: weak intensity of anthocyanin colouration of silks, short husk (level with tip), conical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, short
KERNEL: dent-like type, yellow on top, orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48PW' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. Selected D1 lines were self pollinated and harvested in bulk. In 2012 and 2014, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH48PW' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Janesville, Wisconsin, USA in 2015.

Tests and Trials: The comparative trial for 'PH48PW' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 29 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000344, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48PW'

	'PH48PW'	**'PH25KM'***
Leaf blade width (cm)		
mean	8.74	10.05
std. deviation	0.68	0.90
Primary ear height (metres)		
mean	0.62	0.76
std. deviation	0.07	0.08
Ear length (cm)		
mean	16.64	13.11
std. deviation	0.67	1.42
Ear diameter (including kernels) (cm)		
mean	4.06	4.53
std. deviation	0.15	0.15

*reference variety

Corn: 'PH48PW' (top) with reference variety 'PH25KM' (bottom)

Proposed denomination: **'PH48RS'**
Application number: 20-10176
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Julia X. Zhang, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH25RY'

Summary: *The brace roots for 'PH48RS' have a medium intensity of anthocyanin colouration whereas those for 'PH25RY' have an absent or a very weak intensity of anthocyanin colouration. The leaf blade just above the upper ear of 'PH48RS' is narrower than that of 'PH25RY'. The tassel for 'PH48RS' has moderately sparse spikelets whereas those for 'PH25RY'are moderately dense with spikelets. The main axis of the tassel for 'PH48RS' is long whereas that for 'PH25RY' is a medium length. The ear of 'PH48RS' is longer, and including the kernels, has a smaller diameter than that of 'PH25RY'. The ear wings for 'PH48RS' are short and present on a high percentage of plants whereas those for 'PH25KM' are a medium length and present on a medium percentage of plants.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs late in season, silk emergence occurs mid season

STEM: absent or very slight degree of zig-zag, medium intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): absent or very weak undulation of margin, small angle with stem, straight

TASSEL: absent or very few primary lateral branches, moderately sparse spikelets on middle third of main branch, long main axis
LATERAL BRANCHES: none
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle

ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, short
KERNEL: dent-like type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48RS' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2012, selected D1 lines were self pollinated and harvested in bulk. In 2014, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH48RS' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Mankato, Minnesota, USA in 2015.

Tests and Trials: The comparative trial for 'PH48RS' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000345, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48RS'

	'PH48RS'	**'PH25RY'***
Leaf blade width (cm)		
mean	8.41	9.18
std. deviation	0.67	0.79
Ear length (cm)		
mean	16.34	15.18
std. deviation	0.88	1.69
Ear diameter (including kernels) (cm)		
mean	4.29	4.78
std. deviation	0.18	0.20

*reference variety

Corn: 'PH48RS' (top) with reference variety 'PH25RY' (bottom)

Proposed denomination: **'PH48VD'**
Application number: 20-10177
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Gustavo Garcia, Pioneer Hi-Bred Production Company, Woodstock, Ontario
Martin Arbelbide, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH1DGV'

Summary: *Including the tassel, the plants of 'PH48VD' are shorter than those of 'PH1DGV'. The leaf blade just above the upper ear of 'PH48VD' is narrower than that of 'PH1DGV'. The leaf blade of 'PH48VD' has a medium degree of undulation of the margin whereas that of 'PH1DGV' has strong undulation of the margin. The main axis above the lowest lateral branch of the tassel of 'PH48VD' is a medium length whereas that of 'PH1DGV' is long. The main axis above the highest lateral branch of the tassel of 'PH48VD' is short whereas that of 'PH1DGV' is a medium length. The lateral branch of the tassel of 'PH48VD' is short whereas that of 'PH1DGV' is a medium length. The lateral branches of the tassel of 'PH48VD' are straight whereas those of 'PH1DGV' are moderately recurved. The primary ear of 'PH48VD' is located lower on the stem than that of 'PH1DGV'. The silks of 'PH48VD' have an absent or very weak intensity of anthocyanin colouration whereas those of 'PH1DGV' have a medium intensity of anthocyanin colouration. The plants of 'PH48VD' have a low percentage of tillering whereas for the plants of 'PH1DGV' tillering is absent.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs mid season, silk emergence occurs early in season

STEM: absent or very slight degree of zig-zag, absent or very weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, slightly recurved

TASSEL: medium number of primary lateral branches, moderately sparse spikelets on middle third of main branch, medium length main axis above lowest lateral branch, short main axis above highest lateral branch
LATERAL BRANCHES: straight, very small angle with main axis, short
GLUME: absent or very weak intensity of anthocyanin colouration at base, absent or very weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a low percentage of plants, medium length
KERNEL: dent-like type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48VD' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in Puerto Vallarta, Mexico. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2012, selected D1 lines were self pollinated and harvested in bulk. In 2014 and 2015, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH48VD' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Woodstock, Ontario, Canada in 2016.

Tests and Trials: The comparative trial for 'PH48VD' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000346, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48VD'

	'PH48VD'	**'PH1DGV'***
Plant height (metres)		
mean	1.79	2.03
std. deviation	0.06	0.07
Leaf blade width (cm)		
mean	7.63	8.78
std. deviation	0.47	0.51
Primary ear height (metres)		
mean	0.57	0.62
std. deviation	0.05	0.06

*reference variety

Corn: 'PH48VD' (left) with reference variety 'PH1DGV' (right)

Corn: 'PH48VD' (top) with reference variety 'PH1DGV' (bottom)

Proposed denomination: **'PH48YG'**
Application number: 20-10178
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Steven King, Pioneer Hi-Bred Production Company, Caledon, Ontario
Manilal William, Pioneer Hi-Bred International, Inc., Kitchener, Ontario

Variety used for comparison: 'PH1DGV'

Summary: *Anthesis for the plants of 'PH48YG' occurs early in the season whereas that for 'PH1DGV' occurs mid season. Including the tassel, the plants of 'PH48YG' are shorter than those of 'PH1DGV'. The leaf blade just above the upper ear of*

'PH48YG' is narrower than that of 'PH1DGV'. The main axis above the highest lateral branch of the tassel of 'PH48YG' is short whereas that of 'PH1DGV' is a medium length. The tassels of 'PH48YG' have many primary lateral branches whereas those for 'PH1DGV' have a medium number of primary lateral branches. The lateral branches of the tassels of 'PH48YG' are slightly recurved whereas those for 'PH1DGV' are moderately recurved. The primary ear of 'PH48YG' is located lower on the stem than it is for 'PH1DGV'. Including the kernels, the ear of 'PH48YG' has a larger diameter than that of 'PH1DGV'. The glumes of the cob of 'PH48YG' have a strong intensity of anthocyanin colouration whereas those of 'PH1DGV' have a medium intensity of anthocyanin colouration. Ear wings are present on a high percentage of plants for 'PH48YG' whereas they are present on a low percentage of plants for 'PH1DGV'. The silks of 'PH48YG' have an absent or very weak intensity of anthocyanin colouration whereas those of 'PH1DGV' have a weak intensity of anthocyanin colouration.

Description:
PLANT: inbred yellow variety, small ratio of height of insertion of peduncle of upper ear to plant height, anthesis and silk emergence occur early in season

STEM: absent or very slight degree of zig-zag, absent or very weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, very small angle with stem, slightly recurved

TASSEL: many primary lateral branches, moderately sparse spikelets on middle third of main branch, long main axis above lowest lateral branch, short main axis above highest lateral branch
LATERAL BRANCHES: slightly recurved, medium sized angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, short husk (level with tip), conico-cylindrical shape, medium number of rows of grain, strong intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, medium length
KERNEL: dent type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48YG' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in Buin, Chile. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. Selected D1 lines were self pollinated and harvested in bulk. In 2014, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH48YG' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Puerto Vallarta, Mexico in 2015.

Tests and Trials: The comparative trial for 'PH48YG' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202000348, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48YG'

	'PH48YG'	**'PH1DGV'***
Plant height (metres)		
mean	1.98	2.07
std. deviation	0.05	0.05

Leaf blade width (cm)		
mean	7.74	8.51
std. deviation	0.55	0.58
Primary ear height (metres)		
mean	0.55	0.68
std. deviation	0.08	0.06
Ear diameter (including kernels) (cm)		
mean	4.43	4.08
std. deviation	0.16	0.17

*reference variety

Corn: 'PH48YG' (left) with reference variety 'PH1DGV' (right)

Corn: 'PH48YG' (top) with reference variety 'PH1DGV' (bottom)

Proposed denomination: **'PH48ZZ'**
Application number: 20-10179
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Jean-Marc Montpetit, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH13GH'

Summary: *Including the tassel, the plants of 'PH48ZZ' are shorter than those of 'PH13GH'. The brace roots of 'PH48ZZ' have an absent or very weak intensity of anthocyanin colouration whereas those of 'PH13GH' have a weak intensity of anthocyanin colouration. The leaf blade just above the upper ear of 'PH48ZZ' is narrower than that of 'PH13GH'. The angle between the leaf blade and the stem for 'PH48ZZ' is small whereas that for 'PH13GH' is a medium size. The angle between the main axis and the lateral branches on the tassel of 'PH48ZZ' is small whereas that for 'PH13GH' is large. In the middle third of the main branch of the tassel, the anthers of 'PH48ZZ' have a medium intensity of anthocyanin colouration whereas those for 'PH13GH' have a strong intensity of anthocyanin colouration. The primary ear for 'PH48ZZ' is located lower on the stem than that of 'PH13GH'. The silks of 'PH48ZZ' have an absent or very weak intensity of anthocyanin colouration whereas the silks of 'PH13GH' have a weak intensity of anthocyanin colouration. The ear wings of 'PH48ZZ' are long whereas those of 'PH13GH' are a medium length.*

Description:
PLANT: inbred yellow variety, medium ratio of height of insertion of peduncle of upper ear to plant height, anthesis occurs early in season, silk emergence occurs very early in season

STEM: absent or very slight degree of zig-zag, absent or very weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): strong undulation of margin, small angle with stem, slightly recurved

TASSEL: medium number of primary lateral branches, medium density of spikelets on middle third of main branch, medium length main axis above lowest lateral branch and highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, medium length
GLUME: absent or very weak intensity of anthocyanin colouration at base, weak intensity of anthocyanin colouration at apex and middle
ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): medium intensity of anthocyanin colouration

EAR: absent or very weak intensity of anthocyanin colouration of silks, medium length husk (extends one quarter length of ear above tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a high percentage of plants, long
KERNEL: intermediate type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH48ZZ' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2009, a cross was conducted between proprietary inbred lines in Moorhead, Minnesota, USA. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. In 2012, selected D1 lines were self pollinated and harvested in bulk. In 2014, D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH48ZZ' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in St. Polycarpe, Quebec, Canada in 2015.

Tests and Trials: The comparative trial for 'PH48ZZ' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured

characteristics were based on a minimum of 26 measurements per variety. Mean differences were significant at the 5% probability level based on Student's T-tests. Results were supported by the official technical examination report 202000349, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH48ZZ'

	'PH48ZZ'	**'PH13GH'***
Plant height (metres)		
mean	1.78	1.99
std. deviation	0.11	0.06
Leaf blade width (cm)		
mean	7.70	8.37
std. deviation	1.01	0.83
Primary ear height (metres)		
mean	0.60	0.70
std. deviation	0.10	0.06

*reference variety

Corn: 'PH48ZZ' (left) with reference variety 'PH13GH' (right)

Corn: 'PH48ZZ' (top) with reference variety 'PH13GH' (bottom)

Proposed denomination: **'PH4D4P'**
Application number: 20-10180
Application date: 2020/05/01
Applicant: Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America
Agent in Canada: Pioneer Hi-Bred Production Co., Calgary, Alberta
Breeder: Martin A. Fabrizius, Pioneer Hi-Bred International, Inc., Johnston, Iowa, United States of America

Variety used for comparison: 'PH1W1F'

Summary: *The leaf blade just above the upper ear of 'PH4D4P' is wider than that of 'PH1W1F'. The main axis above the lowest lateral branch of the tassel of 'PH4D4P' is very long whereas that for 'PH1W1F' is very short. The main axis above the highest lateral branch of the tassel of 'PH4D4P' is long whereas that for 'PH1W1F' is very short. The lateral branch on the tassel of 'PH4D4P' is a medium length whereas that of 'PH1W1F' is very short. The primary ear for 'PH4D4P' is located higher on the stem than that of 'PH1W1F. The ear of 'PH4D4P' is longer, and including the kernels, has a larger diameter than that of 'PH1W1F'. The ear wings of 'PH4D4P' are long whereas those of 'PH1W1F' are a medium length.*

Description:
PLANT: inbred yellow variety, large ratio of height of insertion of peduncle of upper ear to plant height, anthesis and silk emergence occur mid season

STEM: absent or very slight degree of zig-zag, absent or very weak intensity of anthocyanin colouration on brace roots

LEAF BLADE (JUST ABOVE UPPER EAR): medium degree of undulation of margin, very small angle with stem, slightly recurved

TASSEL: many primary lateral branches, medium density of spikelets on middle third of main branch, very long main axis above lowest lateral branch, long main axis above highest lateral branch
LATERAL BRANCHES: straight, small angle with main axis, medium length
GLUME: weak intensity of anthocyanin colouration at base, medium intensity of anthocyanin colouration at apex and middle

ANTHER (ON MIDDLE THIRD OF MAIN BRANCH OF TASSEL): absent or very weak intensity of anthocyanin colouration

EAR: strong intensity of anthocyanin colouration of silks, short length husk (level with tip), conico-cylindrical shape, medium number of rows of grain, medium intensity of anthocyanin colouration on glumes of cob
EAR WINGS: present on a medium percentage of plants, long
KERNEL: dent type, yellow on top, yellow orange on dorsal side

TILLERING: present on a low percentage of plants

Origin and Breeding: 'PH4D4P' was developed by Pioneer Hi-Bred International, Inc. using a double haploid plant breeding method. In 2010, a cross was conducted between proprietary inbred lines in Willmar, Minnesota, USA. In 2011, the F1 generation underwent a haploidization process with subsequent chromosome doubling and selfing. Selected D1 lines were self pollinated and harvested in bulk. In 2015 and 2016, the D2 and D3 lines were self pollinated with subsequent ear selections, respectively. 'PH4D4P' was selected based on tassel size, pollen production, germination ability, stalk lodging resistance, late season plant health, yield in hybrid combination, grain quality, as well as disease and insect resistance. The D5 seed was bulked as breeder seed in Puerto Vallarta, Mexico in 2017.

Tests and Trials: The comparative trial for 'PH4D4P' was conducted in Coteau-du-Lac, Quebec during the 2021 growing season. The trial was planted in a RCB design with 3 replicates. Each replicate consisted of one 3 metre long row with 76 cm between the rows. With approximately 20 plants per row, there was a total of 50 to 60 plants per variety. Measured characteristics were based on a minimum of 30 measurements per variety. Mean differences were significant at the 5% probability level based on paired Student's T-tests. Results were supported by the official technical examination report 202100335, purchased from the Plant Variety Protection Office in Washington, District of Columbia, USA.

Comparison table for 'PH4D4P'

	'PH4D4P'	**'PH1W1F'***
Leaf width (cm)		
mean	9.14	7.81
std. deviation	0.56	0.50
Primary ear height (metres)		
mean	0.71	0.63
std. deviation	0.09	0.09
Ear length (cm)		
mean	18.44	16.19
std. deviation	0.97	1.05
Ear diameter (including kernels) (cm)		
mean	4.48	4.20
std. deviation	0.16	0.13

*reference variety

Corn: ‘PH4D4P’ (left) with reference variety ‘PH1W1F’ (right)

Corn: ‘PH4D4P’ (top) with reference variety ‘PH1W1F’ (bottom)