



Government of Pakistan  
PBRR, Pakistan

**Plant Breeders' Rights Registry**

## **Plant Breeders' Rights Journal**



Official Journal of Plant Breeders' Rights Registry, Pakistan

*October 2023*

# **PLANT BREEDERS' RIGHTS JOURNAL**

An official journal

of

**Plant Breeders' Rights Registry  
Ministry of National Food Security and Research  
Government of Pakistan**

Plant Breeders' Rights Registry G-9/4,  
Mauve Area, Islamabad, Pakistan

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## ISSUANCE OF CERTIFICATES TO PBR PROTECTED PLANT VARIETIES

Plant Breeders' Rights Registry has issued the following fifteen (15) certificates of Plant Breeders' Rights in favor of varieties listed below:

S. No.	Crop	Institute/ Agency	Name of Variety
1	Maize	Data Agro Limited	DAL-2271
2	Wheat	Arid Zone Research Institute, Bhakkar	Bhakkar Star
3	Maize	Bayer Pakistan Private Limited, Karachi	DK-6321
4	Maize	Bayer Pakistan Private Limited, Karachi	DK-7024
5	Banana	PARC-NARC	NIGAB-1
6	Banana	PARC-NARC	NIGAB-2
7	Canola	Oilseeds Research Institute, Faisalabad	Sandal Canola
8	Sunflower	Oilseeds Research Institute, Faisalabad	Orisun-516
9	Sunflower	Oilseeds Research Institute, Faisalabad	Orisun-648
10	Sunflower	Oilseeds Research Institute, Faisalabad	Orisun-675
11	Sunflower	Oilseeds Research Institute, Faisalabad	Orisun-701
12	Canola	Oilseeds Research Institute, Faisalabad	Rachna Canola
13	Rice	Soil Salinity Research Institute	Al Khalid Rice
14	Wheat	PARC-NARC	NARC Super
15	Maize	Kissan Seed Corporation's Research Farm, Sahiwal	SB-319

Any action in violation of the provision of subsection (1) of section 22 shall be deemed to be an infringement including;

- a) Using a protected variety under this act without legal authorization to produce an essentially derived variety or F1 hybrid for commercial utilization
- b) Offering for sale or selling or marketing of the reproductive or vegetative propagating material of the protected variety in Pakistan
- c) Importing the reproductive or vegetative propagating material of the protected variety into Pakistan or exporting it from Pakistan
- d) Conditioning or multiplying the reproductive or vegetative propagating material of the protected

- e) Carrying out any of the acts identified in clauses (b), (c) and (d) in relation to an essentially derived variety provided the protected variety is not itself an essentially derived variety
- f) Instigating or promoting any of the acts identified in clause (b), (c), (d) and (e)
- g) Authorizing any person to produce, sell, market or otherwise deal with a protected variety and
- h) Stocking for any of the purposes mentioned in clauses (a) to (g)

In case of proved violation of rights, the court may order compensation to the owner of rights, fine not exceeding the quantum of loss caused or benefit derived from such violation.

## **DETAILS OF PBR PROTECTED PLANT VARIETIES**

### **1. Application No.: PBRR-Maize-08/21**

Name of the Applicant: Data Agro Limited  
 Institute: Data Agro Limited  
 Name of Breeder(s): Dr. Anwar ul Haq  
 Name of Co-breeder(s):  
 Application for: New Plant Variety  
 Denomination of Variety: DAL-2271  
 Crop: Maize (*Zia mays* L.)  
 Type of Variety: Hybrid  
 Name of Initial Variety  
 (in case EDV): Not Applicable  
 Salient features:

<b>CHARACTERISTICS</b>	<b>DESCRIPTION</b>
Maturity Duration	Medium
Sowing Time	Autumn (mid june to end august)
<b>SEEDLING CHARACTERISTICS</b>	
Seedling length (cm)	19.95
Coleoptile's anthocyanin	Strong

First leaf colour	Green
First leaf tip	Round
First leaf length (mm)	8.37
First leaf width (mm)	1.73
<b>PLANT CHARACTERISTICS FOR HYBRID AND OPEN POLLINATED VARIETIES ONLY</b>	
Plant length up to flag leaf	Long (>170 cm)
<b>STEM CHARACTERISTICS</b>	
Stem length (cm)	260-275
Internodal length (cm)	16-18
Internodal diameter (cm)	5-6
Mid node anthocyanin	Present
Stem tillering	Absent
Stem anthocyanin coloration of brace roots	Present
<b>LEAF CHARACTERISTICS</b>	
Leaf angle between blade and stem (on leaf just above upper ear)	Small <45°
Leaf attitude of blade (on leaf just above upper ear)	Straight
Leaf width of blade (leaf of upper ear)	Medium (8-9 cm)
<b>TASSEL CHARACTERISTICS</b>	
50% Tassel emergence (days)	51-53
50% Tassel emergence (days)	Medium (50-55 days)
Anthocyanin coloration at the base of glume (in middle third of main axis)	Absent
Anthocyanin coloration of glume excluding base (in middle third of main axis)	Present
Angle between main axis and lateral branches	Wide (in lower third of tassel)
Attitude of lateral branches (in lower third of tassel)	Curved
Anthocyanin coloration of anthers (in middle third of main axis on fresh anthers)	Present
Density of spikelets (in middle third of tassel)	Dense
Tassel angle between main axis and lateral branches	Wide (<45) (in lower third of tassel)
Earlier than	YH-1898

Later than	
Tassel length (cm)	35-40
Tassel stalk length (cm)	24-26
Exsertion above flag leaf (cm)	9-11.5
No. of lateral branches	9-10
Lateral branches density	Lax
<b>FLOWER CHARACTERISTICS</b>	
Anther fertility	Normal
Pollen shading	Heavy
Anther color	Purple
Pollen color	Dark Yellow
Glume color	Green
<b>EAR CHARACTERISTICS</b>	
50% silk emergence(days)	53-54
Later than	YH-1898
Silk color	Green
Insertion height (cm)	80-100
Peduncle length (cm)	7-10
Ear leafy extensions	Short
Ear husk length	Long
No. of husk blades	10-12
Ear shape	Cylindrical
Ear length (cm)	21-26
Seed rows/ear	16-18
Seed/row	44-46
Seed row arrangment	Straight
Cob color	Pink
<b>SEED CHARACTERISTICS</b>	
Seed color	Orange
Seed tip color	Yellow
Color of sides	Orange

Seed shape	Indented
Seed length (mm)	11.8
Seed width (mm)	8.84
Seed thickness (mm)	4.36
Seed type	Semi Flint
Seed wax	Absent
Seed size	Bold
Seed weight/ear (g)	182.7
1000 Seed weight (g)	269-271
Grain. Cob ratio	83%
Yeild/ha.(mt)	9-10
Seed sweetness	Present
Seed waxiness	Absent
Seed opaqueness	Present
<b>Distinguishing Characteristics:</b>	<p>It is medium maturity yellow corn single cross hybrid. It's 50% flowering during autumn season ranges from 50-60 days; whereas, 50% silking ranges from 51-61 days. The hybrid matures in 90-100 days. Average yeild of 2271 during kharif-2017 NUYT was 7138 kg/ha, and 9147 kg/ha during kharif 2018. It was 3.6% and 23.5 % higher than the check. It is a tall hybrid with plant height ranging from 2.25-2.5 meters depending upon plant population. Ear placement is below the middle of the plant ranging from 80 cm to 110 cm. Plant has 16-17 leaves. The tassle size is medium with 8-10 branches. It has got green silks and purple anthers. The pollen shading of tassle is very heavy. the ear of the hybrid is cylindrical with a loose husk cover. The grain texture of the ear is semi dent with orange red color. the color of the cob is purple. The peduncle of the ear is small to medium. Leaf orientation of the hybrid is upright.</p>



Form PB-10  
[See Rule 13(1)]

Serial No. 000001

# Government of Pakistan Plant Breeders' Rights Registry



## CERTIFICATE OF PLANT VARIETY PROTECTION

Registration No. 01-MZ/08-2021

Dated: 02-03-2021

Crop: Maize

Denomination of Variety: DAL2271

Type: Enlisted

Conventional/GMC: Conventional

OP/Hybrid: Hybrid

Local/Exotic: Local

As declared

- That Dr. Anwal-Ul-Haq

has/have developed new plant variety and also that he is the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**DATA AGRO LIMITED, KHANEWAL**

داتا ایگرو لمیٹڈ، خانہوال

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 02<sup>nd</sup> day of March 2021 and expiring on the 01<sup>st</sup> day of March 2041



Registrar

Date of Grant

*Hayatullah*

28-09-2023

## 2. Application No.: PBRR-Wheat-30/21

Name of the Applicant: Arid Zone Research Institute, Bhakkar  
Institute: Arid Zone Research Institute, Bhakkar  
Name of Breeder(s):  
i. Dr. Muhammad Irshad, Senior Scientist, AZRI, Bhakkar  
ii. Mrs. Zubeda Parveen, Scientific Officer, AZRI, Bhakkar  
iii. Dr. Khalid Hussain, Principal Scientist, AZRI, Bhakkar  
Name of Co-breeder(s):  
Application for: New Plant Variety  
Denomination of Variety: Bhakkar star  
Crop: Wheat (*Triticum aestivum* L.)  
Type of Variety: OPV  
Name of Initial Variety  
(in case EDV): Not Applicable  
Salient features:

CHARACTERISTICS	DESCRIPTION	
	2017-18	2018-19
Days to Maturity		
Maturity Duration	Medium	Medium
Earlier than	Pakistan-2013	Pakistan-2013
Later than	Jouhar-2016	Jouhar-2016
Suitable for sowing	Early	Early
<b>SEEDLING CHARACTERISTICS</b>		
Growth habit	Semi erect	Semi erect
Coleoptile color	Colorless	Colorless
Seedling anthocyanin	absent	absent
<b>PLANT CHARACTERISTICS</b>		
Plant height (cm)	105-110	105-110
Taller than	Gold-2016	Gold-2016
Shorter than	Jouhar-2016	Jouhar-2016
Color booting stage	Pale Green	Pale Green

<b>STEM CHARACTERISTICS</b>		
Stem anthocyanin	Absent	Absent
Stem waxy bloom	Weak	Weak
Stem wall thickness	Intermediate	Intermediate
Stem stiffness	Intermediate	Intermediate
Stem diameter mm	4	4
Peduncle length cm	30-35	30-35
Productive tillers/m	150-155	150-155
Nodes/Stem	4-5	4-5
Straw Color	Yellowish White	Yellowish White
Lodging	Absent	Absent
<b>FLAG LEAF CHARACTERISTICS</b>		
Flag leaf attitude	Erect	Semi erect
Flag leaf twist	Medium	Medium
Length cm	22-26	25-30
Width cm	1.6-1.9	1.5-1.8
Sheath wax	Weak	Weak
Sheath hairiness	Sparse	Sparse
Auricle hairiness	Absent	Absent
<b>EAR CHARACTERISTICS</b>		
Ear emergence	100-105	100-105
Ear size	Medium	Medium
Length cm	11-12	11-12
Width cm	1.2-1.4	1.2-1.4
Wax at anthesis	Weak	Weak
Color at maturity	Yellowish white	Yellowish white
Ear shape	Tapering	Tapering
Ear density	Dense	Dense
Super numerary spikelets	absent	absent
Speltoids	absent	absent
Shattering	resistant	resistant

Ear kink/twist	Weak	Weak
Ear Awnedness	Awned	Awned
Awn distribution	Whole	Whole
Awn length	medium	medium
Awn color	Yellowish white	Yellowish white
Awn habit	Erect	Erect
Anther Color	yellow	yellow
Rachis hairs apical	medium	medium
Rachis hairs margin	medium	medium
Rachis length cm	11	11
Rachis width mm	4	4
No. of segments	13-14	13-14
<b>GLUME CHARACTERISTICS</b>		
Glume length mm	10-11	10-11
Glume width Size mm	4-5	4-5
Glume length Size	Medium	Medium
Glume width size	Medium	Medium
Lower glume shape	Broad Flat	Broad Flat
Glume attachment	Strong	Strong
Glume Pubescence	Absent	Absent
Glume surface	Rough	Rough
Lower glume shoulder shape	Round	Round
Lower glume shoulder width	Medium	Medium
Beak length mm	3-4	3-4
Lower glume beak shape	Curved and Humped	Curved and Humped
Lower glume Beak Size	Medium	Medium
Beak spicules	Present	Present
Keel spicules	1	1
Glume internal hair	Absent	Absent
Glume internal imprint	Medium	Medium
<b>SEED CHARACTERISTICS</b>		

Seed color	Amber	Amber
Seed surface	Opaque	Opaque
Seed shape	Oval	Oval
Seed length mm	7-8	7-8
Seed width mm	4-5	4-5
Seed Thickness mm	4-5	4-5
Seed size	Bold	Bold
Seed brush	Short	Short
Seed Germ size	Medium	
1000 seed weight	53-55	
Seed groove	Intermediate	Intermediate
Seed/ Ear	60-70	60-70
Seed hardness	Medium	Medium
<b>Distinguishing Characteristics</b>	A high yielding full season variety, stem wall thick and intermediate to soft in stiffness, ear dense and yellowish white at maturity whereas white in UJALLA-2016 and JOUHAR-2016. lower glume shoulder shape is round same as in wheat variety UJALA-2016	A high yielding full season variety, stem wall thick and intermediate to soft in stiffness, ear dense and yellowish white at maturity whereas white in UJALLA-2016 and JOUHAR-2016. lower glume shoulder shape is round same as in wheat variety UJALA-2016



Form PB-10  
[See Rule 13(1)]

Serial No. 000002

## Government of Pakistan Plant Breeders' Rights Registry



### CERTIFICATE OF PLANT VARIETY PROTECTION

Registration No.	02-WT/30-2021	Dated:	28-09-2021
Crop:	Wheat	Denomination of Variety:	Bhakkar Star
Type:	Registered	Conventional/GMC:	Conventional
OP/Hybrid:	OP	Local/Exotic:	Local

As declared

- That Dr. Muhammad Irshad, Mrs. Zubeda Parveen & Dr. Khalid Hussain

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

#### **ARID ZONE RESEARCH INSTITUTE, BHAKKAR**

ایرڈزون ریسرچ انسٹی ٹیوٹ، بھکر

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 28<sup>th</sup> day of September 2021 and expiring on the 27<sup>th</sup> day of September 2041



Registrar

Date of Grant 28-09-2023

*Hayatullah*

### 3. Application No.: PBRR-Maize-31/21

Name of the Applicant: Bayer Pakistan (Private) Limited

Institute: Bayer Pakistan (Private) Limited

Name of Breeder(s):

Prashant Golegaonkar-Monsanto Thailand Limited 56 M006  
Dinthong Wongthong Phitsanulok, 65130 Thailand

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: DK-6321

Crop: Maize (*Zea mays* L.)

Type of Variety: Hybrid

Name of Initial Variety

(in case EDV): Not Applicable

Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
<b>STEM CHARACTERISTICS</b>		
Stem length (cm)	220-225	215-225
Internodal length (cm)	2.7-3.0	14-15
Mid node anthocyanin	Absent	Absent
Stem tillering	Absent	Absent
Stem anthocyanin coloration of brace roots	Present	-
Root anthocyanin	-	Present (weak)
<b>LEAF CHARACTERISTICS</b>		
Leaf angle between blade and stem (on leaf just above upper ear)	Small	
Leaf attitude of blade (on leaf just above upper ear)	Straight	
Leaf width of blade (leaf of upper ear)	Broad	

Leaf Color		Green
Mid leaves attitude		Erect
Leaf Sheath Anthocyanin		Weak
Marginal Serration		Absent
<b>TASSEL CHARACTERISTICS</b>		
Angle between main axis and lateral branches	Wide	
Attitude of lateral branches (in lower third of tassel)	Curved	
Tassel angle between main axis and lateral branches	Wide	
Tassel length (cm)	14-16	
Tassel stalk length (cm)	5-7	
Exsertion above flag leaf (cm)	4-5	
No. of lateral branches	8-9	
Lateral branches density	Intermediate	
<b>FLOWER CHARACTERISTICS</b>		
Anther fertility	Normal	
<b>EAR CHARACTERISTICS</b>		
Silk color	Green	Green
Insertion height (cm)		115-120
Peduncle length (cm)	10-11	10
Ear husk length	Medium	Medium
No. of husk blades	9-11	
Ear shape	Cylindrical	
No. of ears/plant	1	1
Cob color	Mixed	
<b>SEED CHARACTERISTICS</b>		
Seed color	Yellow	Yellow
Seed rows/ear		16
Seed/row		42-45
Seed row arrangement	Straight	
Seed tip color	White	
Color of sides	Orange	

Seed shape	Indented	Indented
Seed length (mm)	12.5-13.5	
Seed width (mm)	8.5-9.4	
Seed thickness (mm)	4.1-4.7	
Seed type		intermediate
Seed wax	Absent	
Seed size	Medium	
Seed weight/ear (g)	220-260	250-260
1000 Seed weight (g)	380	380
Seed sweetness	Absent	
Insect	Trace	



Form PB-10  
[See Rule 13(1)]

Serial No. 000003



## Government of Pakistan Plant Breeders' Rights Registry

### CERTIFICATE OF PLANT VARIETY PROTECTION

Registration No.	03-MZ/31-2021	Dated:	28-09-2021
Crop:	Maize	Denomination of Variety:	DK6321
Type:	Enlisted	Conventional/GMC:	Conventional
OP/Hybrid:	Hybrid	Local/Exotic:	Local

As declared

- That Prashant Golegaonkar

has/have developed new plant variety and also that he is the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**BAYER PAKISTAN (PRIVATE) LIMITED, KARACHI**

بایر پاکستان (پرائیویٹ) لمیٹڈ، کراچی

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 28<sup>th</sup> day of September 2021 and expiring on the 27<sup>th</sup> day of September 2041



Registrar

Date of Grant 28-09-2023

*Hayatullah*

#### 4. Application No.: PBRR-Maize-32/21

Name of the Applicant: Bayer Pakistan (Private) Limited

Institute: Bayer Pakistan (Private) Limited

Name of Breeder(s):

Prashant Golegaonkar-Monsanto Thailand Limited 56 M006  
Dinthong Wongthong Phitsanulok, 65130 Thailand

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: DK-7024

Crop: Maize (*Zia mays* L.)

Type of Variety: Hybrid

Name of Initial Variety

(in case EDV): Not Applicable

Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
<b>STEM CHARACTERISTICS</b>		
Stem length (cm)	245-250	242-250
Internodal length (cm)	21-22	21.5-22.5
Mid node anthocyanin		Weak
Stem tillering		Absent
Root anthocyanin		Absent
<b>LEAF CHARACTERISTICS</b>		
Leaf angle between blade and stem (on leaf just above upper ear)	Small	
Leaf attitude of blade (on leaf just above upper ear)	Straight	
Leaf width of blade (leaf of upper ear)		
Leaf Color		Dark Green
Mid leaves attitude		Semi Erect
Leaf Sheath Anthocyanin		Weak
Marginal Serration		Absent
<b>TASSEL CHARACTERISTICS</b>		

Angle between main axis and lateral branches	Wide	
Attitude of lateral branches (in lower third of tassel)	Curved	
Tassel length (cm)	35-38	
Tassel stalk length (cm)	6.5-7.5	
No. of lateral branches	7-9	
Lateral branches density	Lax	
Lateral branches attitude	Straight	
<b>EAR CHARACTERISTICS</b>		
Silk color	Green	Green
Insertion height (cm)		140-150
Peduncle length (cm)	3.0-3.4	3-4
Ear leafy extensions	Absent	
Ear husk length	Medium	Medium
Ear shape	Cylindrical	
Ear length (cm)	8-9	
Ear diameter (cm)	7.0-7.2	
Seed rows/ear	35-38	
Seed/row	18-20	
No. of ears/plant	1	1
Cob Pith color	Reddish	
Cob color		Pink
<b>SEED CHARACTERISTICS</b>		
Seed color	Yellow Orange	
Seed rows/ear		16-18
Seed/row		35-40
Seed row arrangement	Straight	
Seed tip color	White	
Color of sides	Orange	
Seed shape	Indented	
Seed type	Semi flint	Semi Flint
Seed wax	Absent	Absent

Seed size		Medium
Seed weight/ear (g)	208-215	208-216
1000 Seed weight (g)	340	342
lodging	low	low
Insect	Trace	Trace



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000004



CERTIFICATE OF PLANT VARIETY PROTECTION

Registration No. 04-MZ/32-2021 Dated: 28-09-2021  
Crop: Maize Denomination of Variety: DK7024  
Type: Enlisted Conventional/GMC: Conventional  
OP/Hybrid: Hybrid Local/Exotic: Local

As declared

- That Prashant Golegaonkar

has/have developed new plant variety and also that he is the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**BAYER PAKISTAN (PRIVATE) LIMITED, KARACHI**

بایر پاکستان (پرائیویٹ) لمیٹڈ، کراچی

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 28<sup>th</sup> day of September 2021 and expiring on the 27<sup>th</sup> day of September 2041



Registrar

*Hayatullah*

Date of Grant 28-09-2023

## 5. Application No.: PBRR-Banana-40/21

Name of the Applicant: Director NIGAB, NARC

Institute: NIGAB, PARC

Name of Breeder(s):

- i. Dr. Aish Muhammad
- ii. Dr. Ghulam Muhammad Ali
- iii. Dr. Iqbal Hussain
- iv. Nisar Hussain Soomro
- v. Dr. Kazim Ali

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: NIGAB-1

Crop: Banana (*Musa Sapientum* L.)

Type of Variety: Hybrid

Name of Initial Variety

(in case EDV): Not Applicable

Salient Features:

<b>CHARACTERISTICS</b>	<b>DESCRIPTION</b>
Leaf Habit	Drooping
Dwarfism	Normal
Pseudostem Height (m)	2.1-2.9
Pseudostem Aspect	Normal
Pseudostem Color	Green to Rust Brown
Pigmentation in the Pseudostem (outermost sheath)	Rusty Brown
Pseudostem Appearance	Shiny
Predominant underlying color of the pseudostem	Pink Purple
Pigmentation of underlying pseudostem	Purple
Sap colour	Watery

Sap dripping on the cutting of leaf's petiole	Drips
Wax on leaf sheath	Moderately Waxy
Number of Suckers	4
Development of Suckers	More than 3/4 of the height of parent plant
Suckers with tubular leaves	without tubular leaves
Position of suckers	close to plant
Blothes at petiole base	small bloches
Blothes color	brown black
Petiole canal leaf III	open with margins spreading
Petiole margin	winged and clasping the psuedo stem
Wing type	not dry
Petiole margin color	Green
Edge of petiole margin	with a color line along
Petiole margin width (cm)	>1 cm
Leaf blade length (cm)	171-220
Leaf blade width (cm)	81-90
Petiole length (cm)	<50 cm
Colour of leaf upper surface	Dark Green
Appearance of leaf upper surface	Shiny
Colour of leaf lower surface	Green
Appearance of leaf lower surface	Shiny
Wax on leaves	Very little
Insertion point of leaf blades on petiole	Symmetric
Shape of leaf blade base	Both sides rounded
Leaf corrugation	very corrugated
Leaf tips	twisted
Colour of midrib dorsal surface	yellow green
Colour of midrib ventral surface	green
Colour of cigar leaf dorsal surface	green
Blotches on leaves of water suckers	little or narrow blotches
Peduncle length (cm)	31-60

Empty nodes on peduncle	0
Peduncle width (cm)	>13 cm
Peduncle color	dark green
Peduncle hairiness	slightly hairy
Bunch position	slightly angled
Bunch shape	truncated cone shape
Bunch appearance	compact
Flower that form the fruit	female
Fruits	Biseriate
Rachis type	Present and male bud maybe degenerated or persistent
Rachis position	with a curve
Rachis appearance	male flowers/ bract above the male bud (but the stalk is bare above flowers/ bracts)
Male bud type	Normal (present)
Male bud shape	like a top
Male bud size	21-30
Bract base shape	Small shoulder
Bract apex shape	Slightly pointed
Bract imbrication	young bracts slightly overlapped (moderately imbricated)
Colour of the bract external face	Purple
Colour of the bract internal face	Orange red
Colour on the bract apex	Tinted with yellow (discolored)
Colour stripes on bract	With discolored lines or stripes on the external face
Bract scars on rachis	Very prominent
Fading of color on bract base	color discontinuing towards the base (loss of pigmentation at the base)
Male bract shape	$X/Y < 0.28$ (Lanceolate)
Male bract lifting	Lifting two or more at a time
Bract behaviour before falling	Not revolute (not rolling)
Wax on the bract	Very little or no visible sign of wax
Presence of the grooves on the bract	Moderate grooving (parallel ridges are distinguishable)

Male flower behaviour	falling after the bract
Compound tepal basic colour	Cream
Compound tepal pigmentation	Rust colored spots
Lobe colour of compoud tepal	yellow
Lobe development of compound tepal	very developed
Free tepal color	translucent white
Free tepal shape	oval
Free tepal appearance	simple folding under apex
Free tepal apex development	very developed
Free tepal apex shape	Triangular
Anther exsertion	Exerted
Filament colour	white
Anther color	cream
Pollen sac color	Cream
Style basic color	white
Pigmentation on style	without pigmentation
Style exsertion	Exerted
Style Shape	straight
Stigma color	yellow
Ovary Shape	straight
Ovary basic color	cream
Ovary pigmentation	very few or no visible sign of pigmentation
Dominant color of male flower	cream
Irregular flowers	0
Arrangement of Ovules	two rowed
Friut position	curved upward (obliquely, at a 45° angle upward)
Number of fruits	13-16
Fruit length (cm)	<15 cm
Friut Shape (longitudinal curvature)	curved
Transverse section of fruit	slightly rigid
Fruit apex	blunt-tipped

Remains of flower relicts at fruit apex	persistant style
Fruit pedicel length (mm)	>21 mm
Fruit pedicel width (mm)	>10 mm
Pedicel surface	hairless
Fusion of pedicels	very partially or no visible sign of fusion
Immature fruit peel color	light green
Mature fruit peel color	bright yellow
Fruit peel thickness (mm)	three or more
Adherence of the fruit peel	fruit peels easily
Cracks in fruit peel	without cracks
Pulp in fruit	with pulp
Pulp color before maturity	cream
Pulp color at maturity	white
Fruit fall from hands	persistant
Flesh texture	soft
Predominant taste	sugary (like 'Pisang Mas')
Cycle under evaluation	cycle 2 and following
Number of plants evaluated	10
Planting to shooting (D)	220
Plant crop cycle (D)	310
Ratoon crop cycle 2 (D)	65
Psuedostem height (cm)	269.8
Psuedostem girth (cm)	63.1
Height of following ratoon (cm)	214
Bunch weight (kg)	12.5
Number of Hands	10.1
Number of fruits	174.1
Fruit length (cm)	13.43
Fruit Diameter (mm)	7.6
Fruit Weight (g)	93.75
Number of living (functional) leaves at flowering	11.22

Number of living (functional) leaves at harvest	8.6
Distinguishing Characters	<p>The Variety NIGAB-I has drooping leaf habits with rusty brown psuedostem pigmentation. The underlying color of psuedostem is pink purple. Peduncle has hairs and male bud is like a top. The bunch shape is cylindrical and individual fingers are arranged in biseriate pattern, curved upward at 45°.</p>



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000005



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No.	05-BN/40-2021	Dated:	10-11-2021
Crop:	Banana	Denomination of Variety:	NIGAB-1
Type:	Registered	Conventional/GMC:	Conventional
OP/Hybrid:	Hybrid	Local/Exotic:	Local

As declared

- That Dr. Aish Muhammad, Dr. Ghulam Muhammad Ali, Dr. Iqbal Hussain, Nisar Hussain Soomro & Dr. Kazim Ali

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**NATIONAL INSTITUTE OF GENOMICS AND ADVANCED BIO-TECHNOLOGY,  
NARC, ISLAMABAD**

نیشنل انسٹی ٹیوٹ آف جینومکس اینڈ ایڈوانسڈ بائیو ٹیکنالوجی، این اے آر سی، اسلام آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty Five years starting from the 10<sup>th</sup> day of November 2021 and expiring on the 09<sup>th</sup> day of November 2046



Registrar

*Hayatul*

Date of Grant 28-09-2023

## 6. Application No.: PBRR-Maize-41/21

Name of the Applicant: Director NIGAB, NARC  
 Institute: NIGAB, PARC  
 Name of Breeder(s):  
 i. Dr. Aish Muhammad  
 ii. Dr. Ghulam Muhammad Ali  
 iii. Dr. Iqbal Hussain  
 iv. Nisar Hussain Soomro  
 v. Dr. Kazim Ali

Name of Co-breeder(s):  
 Application for: New Plant Variety  
 Denomination of Variety: NIGAB-2  
 Crop: Banana (*Musa Sapientum* L.)  
 Type of Variety: Hybrid  
 Name of Initial Variety  
 (in case EDV): Not Applicable  
 Salient features:

CHARACTERISTICS	DESCRIPTION
Leaf Habit	Drooping
Dwarfism	Normal
Pseudostem Height (m)	≥3
Pseudostem Aspect	Normal
Pseudostem Color	Green to Rusty Brown
Pigmentation in the Pseudostem (outermost sheath)	Rusty Brown
Pseudostem Appearance	Shiny
Predominant underlying color of the pseudostem	Pink Purple
Pigmentation of underlying pseudostem	Purple
Sap colour	Watery
Sap dripping on the cutting of leaf's petiole	Drips
Wax on leaf sheath	Moderately Waxy
Number of Suckers	4
Develepment of Suckers	Taller than parent Plant

Suckers with tubular leaves	without tubular leaves
Position of suckers	close to parent
Blothes at petiole base	small bloches
Blothes color	brown black
Petiole canal leaf III	open with margins spreading
Petiole margin	winged and clasping the psuedo stem
Wing type	not dry
Petiole margin color	Green
Edge of petiole margin	with a color line along
Petiole margin width (cm)	>1 cm
Leaf blade length (cm)	171-220
Leaf blade width (cm)	81-90
Leaf Ratio	-
Petiole length (cm)	<50 cm
Colour of leaf upper surface	Dark Green
Appearance of leaf upper surface	Shiny
Colour of leaf lower surface	Medium Green
Appearance of leaf lower surface	Dull
Wax on leaves	Very little
Insertion point of leaf blades on petiole	Symmetric
Shape of leaf blade base	Both sides rounded
Leaf corrugation	very corrugated
Leaf tips	twisted
Colour of midrib dorsal surface	yellow green
Colour of midrib ventral surface	light green
Colour of cigar leaf dorsal surface	other
Blotches on leaves of water suckers	little or narrow blotches
Peduncle length (cm)	≥61
Empty nodes on peduncle	0
Peduncle width (cm)	>13 cm
Peduncle color	dark green

Peduncle hairiness	slightly hairy
Bunch position	hanging vertically
Bunch shape	truncated cone shape
Bunch appearance	compact
Flower that form the fruit	female
Fruits	Biseriate
Rachis type	Present and male bud maybe degenerated or persistent
Rachis position	falling vertically with small curve
Rachis appearance	male flowers/ bract above the male bud (but the stalk is bare above flowers/ bracts)
Male bud type	Normal (present)
Male bud shape	like a top
Male bud size	<20 cm
Bract base shape	Small shoulder
Bract apex shape	Intermediate
Bract imbrication	young bracts slightly overlapped (moderately imbricated)
Colour of the bract external face	Purple
Colour of the bract internal face	Orange red
Colour on the bract apex	Not tinted with yellow (color is uniform until apex)
Colour stripes on bract	With discolored lines or stripes on the external face
Bract scars on rachis	Very prominent
Fading of color on bract base	color discontinuing towards the base (loss of pigmentation at the base)
Male bract shape	$X/Y < 0.28$ (Lanceolate)
Male bract lifting	Lifting two or more at a time
Bract behaviour before falling	Not revolute (not rolling)
Wax on the bract	Very little or no visible sign of wax
Presence of the grooves on the bract	Moderate grooving (parallel ridges are distinguishable)
Male flower behaviour	falling after the bract
Compound tepal basic colour	Cream
Compound tepal pigmentation	Rust colored spots

Lobe colour of compoud tepal	yellow
Lobe development of compound tepal	very developed
Free tepal color	translucent white
Free tepal shape	oval
Free tepal appearance	simple folding under apex
Free tepal apex development	very developed
Free tepal apex shape	Triangular
Anther exsertion	Exerted
Filament colour	Cream
Anther color	cream
Pollen sac color	Cream
Style basic color	white
Pigmentation on style	without pigmentation
Style exsertion	Same level
Style Shape	Curved under stigma
Stigma color	yellow
Ovary Shape	straight
Ovary basic color	Light green
Ovary pigmentation	very few or no visible sign of pigmentation
Dominant color of male flower	cream
Irregular flowers	0
Arrangement of Ovules	two rowed
Friut position	curved upward (obliquely, at a 45° angle upward)
Number of fruits	13-16
Fruit length (cm)	<15 cm
Friut Shape (longitudinal curvature)	curved
Transverse section of fruit	Pronounced ridges
Fruit apex	blunt-tipped
Remains of flower relicts at fruit apex	persistant style
Fruit pedicel length (mm)	>21 mm
Fruit pedicel width (mm)	>10 mm

Pediceal surface	Hairy
Fusion of pedicels	very partially or no visible sign of fusion
Immature fruit peel color	light green
Mature fruit peel color	bright yellow
Fruit peel thickness (mm)	three or more
Adherence of the fruit peel	fruit peels easily
Cracks in fruit peel	Cracked
Pulp in fruit	with pulp
Pulp color before maturity	cream
Pulp color at maturity	white
Fruit fall from hands	persistant
Flesh texture	soft
Predominant taste	Sweet (like Cavendish)
Cycle under evaluation	cycle 2 and following
Number of plants evaluated	10
Planting to shooting (D)	270
Plant crop cycle (D)	350
Ratoon crop cycle 2 (D)	60
Pseudostem height (cm)	281.4
Pseudostem girth (cm)	64.1
Height of following ratoon (cm)	196.8
Bunch weight (kg)	17
Number of Hands	10
Number of fruits	167.2
Fruit length (cm)	14.53
Fruit Diameter (mm)	9.34
Fruit Weight (g)	72.22
Number of living (functional) leaves at flowering	11.7
Number of living (functional) leaves at harvest	9.7
Distinguishing Characters	The NIGAB-2 varitey has looping leaf habits with dull appearance of lower side of leaves hand has very little wax. It's peduncle color is

green and bunch hangs vertically. Fruit bunch is truncated cone shape and fingers are arranged on biserial pattern. Rachis falls vertically with very prominent bracket scars and male bud is like top. Fingers has pronounced ridges and are blunt tipped.



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000006



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No.	06-BN/40-2021	Dated:	10-11-2021
Crop:	Banana	Denomination of Variety:	NIGAB-2
Type:	Registered	Conventional/GMC:	Conventional
OP/Hybrid:	Hybrid	Local/Exotic:	Local

As declared

- That Dr. Aish Muhammad, Dr. Ghulam Muhammad Ali, Dr. Iqbal Hussain, Nisar Hussain Soomro & Dr. Kazim Ali

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**NATIONAL INSTITUTE OF GENOMICS AND ADVANCED BIO-TECHNOLOGY,  
NARC, ISLAMABAD**

نیشنل انسٹی ٹیوٹ آف جینومکس اینڈ ایڈوانسڈ بائیو ٹیکنالوجی، این اے آر سی، اسلام آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty Five years starting from the 10<sup>th</sup> day of November 2021 and expiring on the 09<sup>th</sup> day of November 2046



Registrar

*Hayatullah*

Date of Grant 28-09-2023

## 7. Application No.: PBRR-Canola-43/21

Name of the Applicant: Chief Scientist (ORI)

Institute: ORI, AARI

Name of Breeder(s):

i. Muhammad Aftab, Chief Scientist, Oil Seeds Research Institute, Faisalabad

ii. Tariq Mahmood, Principal Scientist, Oil Seeds Research Institute, Faisalabad

iii. Hafiz Saad Bin Mustafa, Scientific Officer, Oil Seeds Research Institute, Faisalabad

iv. Dr. Mariam Hassan, Scientific Officer, Oil Seeds Research Institute, Faisalabad

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: Sandal Canola

Crop: Canola (*Brassica napus* L.)

Type of Variety: OPV

Name of Initial Variety

(in case EDV): Not Applicable

Salient Features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Maturity duration	Medium	Medium
Crop Season	Rabi	Rabi
Sowing time	Mid October	Mid October
<b>Seedling Characteristics</b>		
Growth habit	Erect	Erect
Seedling length cm	3.0-4.5	4.0-6.0
Cotyledon length mm	9-10	7
Cotyledon width mm	14-16	11-14
Seedling anthocyanin	Strong	Strong
<b>Plant Characteristics</b>		

Plant height cm	210-240	200-230
Plant type	determinate	determinate
Growth habit	Intermediate	Intermediate
Plant color	Dark Green	Dark Green
<b>Leaf Characteristics</b>		
Leaf color	Green	Dark Green
Leaf attitude	Semi Erect	Semi Erect
Leaf size	Large	Large
Leaf length cm	20-25	23-26
Leaf width cm	15-18	18-19
Petiole base	Medium to Broad	Broad
Petiole length cm	15-23	25-30
Leaf lobing	Deeply lobed	Deeply lobed
Leaf Margin indent	Medium	Medium
Terminal segment	Large	Large
Leaf hair	Absent	Absent
Leaf auricles	Absent (partially present)	Absent (partially present)
Leaf anthocyanin	Absent	Absent
Leaf attachment	Stalked	Stalked
<b>Stem characteristics</b>		
Stem shape	Roundish	Roundish
Stem thickness mm	15-20	15-20
Stem stiffness	Medium	Medium
Stem pith	Hollow	Hollow
Ramification	Low level	Low level
<b>Flower Characteristics</b>		
Days to flower 50%	65-70	65-70
Petal color	Yellow	Yellow
Anther dotting	Absent	Absent
Pollination	Self	Self
<b>Pod Characteristics</b>		

Pod shape	Flat	Flat
Pod anthocyanin	Absent	Absent
Pod attitude	Horizontal	Horizontal
Pod density	medium	Medium
Pod length mm	50-58	75-80
Pod Width mm	5.0-6.0	5.0-6.0
Pedicle length	2.5-3.5 (cm)	28-40 (mm)
Beak shape	Slender	Conical
Beak length mm	14-16	10-12
Shattering	Medium	Medium
<b>Seed Characteristics</b>		
Seed color	Blackish	Blackish
Seed size	Slightly bold	Slightly bold
Reticulation	absent	absent
1000 seed weight gms	7	7



Form PB-10  
[See Rule 13(1)]

Serial No. 000007

## Government of Pakistan Plant Breeders' Rights Registry



### CERTIFICATE OF PLANT VARIETY PROTECTION

Registration No. 07-CN/43-2021

Dated: 21-12-2021

Crop: Canola

Denomination of Variety: Sandal Canola

Type: Registered

Conventional/GMC: Conventional

OP/Hybrid: Hybrid

Local/Exotic: Local

As declared

- That Muhammad Aftab, Tariq Mahmood, Hafiz Saad Bin Mustafa & Dr. Mariam Hassan

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.

- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

#### OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD

آئل سیڈز ریسرچ انسٹی ٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 21<sup>st</sup> day of December 2021 and expiring on the 20<sup>th</sup> day of December 2041



Registrar

Date of Grant 28-09-2023

*Hayatullah*

## 8. Application No.: PBRR-Sunflower-44/21

Name of the Applicant: Chief Scientist (ORI)

Institute: ORI, AARI

Name of Breeder(s):

i. Muhammad Aftab, Chief Scientist, Oil Seeds Research Institute, Faisalabad

ii. Dr. Sajida Habib, Senior Scientist, Oil Seeds Research Institute, Faisalabad

iii. Tariq Mahmood, Principal Scientist, Oil Seeds Research Institute, Faisalabad

iv. Muhammad Aslam, Scientific Officer, Oil Seeds Research Institute, Faisalabad

v. Dr. Rizwana Qamar, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vi. Fida Hussain, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vii. Hafiz Saad Bin Mustafa, Scientific Officer, Oil Seeds Research Institute, Faisalabad

viii. Saleem ur Rehman, Assistant Botanist, Maize and Millet Research Institute, Sahiwal

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: Orisun-516

Crop: Sunflower (*Helianthus annuus* L.)

Type of Variety: Hybrid (F1)

Name of Initial Variety

(in case EDV): Not Applicable

### Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Maturity days	Late	Medium to late
Normal crop sowing season	Spring	Spring
Suitable for sowing	All sowing	All sowing
Uniformity in maturity	Intermediate	Intermediate
<b>Seedling Characteristics</b>		

Seedling length cm (14 days)	10.0-12.0	10.0-12.0
Seedling anthocyanin		
Seedling hariness	Medium	Medium
Seedling color	Green	Green
Hypocotyl anthocyanin	Absent	Absent
Anthocyanin color on margin of young leaves	Absent	Absent
<b>Plant/ Stem Characteristics</b>		
Main stem color at heading	Light Green	Light Green
Growth point	Yellow Green	Yellow Green
Stem anthocyanin	Absent	Absent
Pubescence at the top 5 cm	Strong to very Strong	Strong to very Strong
Stem pubescence length	Short	Medium
Stem stiffness	intermediate	intermediate
Stem diameter (at mid) cm	3.5-3.7	3.2-3.5
Plant height at full flowering cm	210-215	210-215
Plant height at full flowering	Medium to Tall	Medium to Tall
Stem branching	Absent	Absent
Natural position of highest lateral head to the central head	NA	NA
length of internode cm (in central third of stem)	11.0-14.0	15.0-19.0
length of internode (in central third of stem)	Medium	Long
Percent stalk breakage	Nil	Nil
Percent root lodging	Nil	Nil
Type of root	Tap	Tap
<b>Leaf Characteristics</b>		
Leaves/plant	22-29	27-31
Leaf color	Green	Green
Leaf anthocyanin on margin of young leaves	Absent	Absent
leaf attitude	Semi erect/ Horizontal	Semi erect/ Horizontal
Leaf surface	Crinkled	Crinkled
Leaf pubescence	Medium	Medium

Leaf pubescence length	Short	Short
Leaf length cm	30.0-32.0 (Long)	27.0-31.0 (Long)
Leaf width cm	35.0-39.0 (Broad)	27.0-30.0 (Broad)
Leaf size	Extremely large	Extremely large
Petiole length cm (at bottom)	23.0-26.0 (Long)	26.0-29.0 (long)
Leaf petiole anthocyanin	Absent	Absent
Leaf angle between lower part of petiole stem	Large	Large
Leaf shape	Cordate to Rounded	Cordate to Rounded
Leaf shape of distal part	Acuminate	Broad Triangular
Leaf apex	Acute	Acute
Leaf base shape	Auriculate	Auriculate
Leaf auricles	Very large	Very large
Leaf wings	None	None
Leaf margin	Dentate	Dentate
Leaf margin indentation depth	Medium	Medium
Leaf margin indentation regularity	Irregular	Irregular
Leaf margin serration (fineness)	Very coarse	Very coarse
Leaf venation	Reticulate	Reticulate
Leaf angle of lowest/ lateral veins	Right angle	Right angle
Leaf height of tip of the blade compared to insertion of petiole	Medium to High	Low
Leaf habit of petiole	Semi erect	Semi erect to Horizontal
Leaf petiole pubescence	Medium	Medium
Leaf senescence	Medium	Medium
Leaf blistering	Absent	Absent
Leaf glossiness	Absent	Absent
Leaf shape of cross section	Strongly concave	Strongly concave
Number of leaves on main stem	High >25	28-32 high >25
<b>Flower Characteristics</b>		
Days to flowering 50%	75-80 (late)	75-80 (late)
Bud diameter (full size stage) cm	13.0-15.0	
Bract tightness on bud	Intermediate	Intermediate

Flowering Uniformity	Intermediate	Intermediate
Ray floret density/ number	Dense, Many	Dense, Many
Ray floret shape	Narrow Ovate	Broad Ovate
Ray floret length cm	5.0-6.5	5.0-6.5
Ray floret width cm	2.2-2.4	1.7-2.3
Ray floret color	Yellow	Yellow
Ray floret size	Large	Medium
Ray floret petal curling	Flat Petal	Flat Petal
Disc flower color	Yellow	Yellow
Stigma color	Yellow	Yellow
Disc flower anthocyanin of stigma	Absent	Absent
Disc flower production of pollen	Medium	Medium
Pollen color	Yellow	Yellow
Extra floral nectaries	Absent	Absent
<b>Head Characteristics</b>		
Bract length on bud cm	5.5-6.5	5.5-6.5
Heads/ plant	Single	Single
Head size/ diameter cm	Large >20	Large >20
Head shape of grain side	Strongly convex	Strongly convex
Head shape uniformity	Intermediate	Intermediate
Head secondary shape of grain size	Strongly convex	Strongly convex
Head depth	Medium	Deep
Receptacle thickness cm	3.8-4.3	4.0-4.3
Head pubescence	Medium	Medium
Involucrer length	Long	Long
Involucrer width	Wide	Wide
Involucrer anthocyanin	Absent	Absent
Head bracts (on back)	Many	Many
Bract shape	Convergent	Convergent
Bract size	Large	Large
Bract length of tip	Long	Long

Bract green color of outside	Medium	Medium
Bract anthocyanin	Absent	Absent
Bract attitude in relation of head	Not embracing	Not embracing
Bract pubescence	Medium	Medium
Bract pubescence length	Short	Short
Head attitude	Overtured	Turned down with slightly curved stem to turned down with strongly curved stem
Head angle	225°	180°
Threshability	Moderate	Moderate
Shattering	Medium	Medium
<b>Seed Characteristics</b>		
Seed weight/ head gms	124	
Seed shape	Broad Ovoid	Broad Ovoid
Seed size	Large	Large
Seed length mm	11.5-12.2 (medium)	11.0-13.0 (medium)
Seed width mm	6.11-6.75 (medium)	6.11-6.75 (medium)
Seed thickness mm	2.83-3.48 (medium)	2.83-3.48 (medium)
Seed main color	Blackish Brown	Blackish Brown
Seed position of strips	Both	Both
Seed strips on margin	Strongly expressed	Strongly expressed
Seed strips between margin	Strongly expressed	Strongly expressed
Seed primary color of strips	Grayish White	Grayish White
Seed spots/mottling on pericarp	Absent	Absent
Seed pericarp thickness	Medium	Medium
Seed cross section shape	Ovoid	Ovoid
Seed pubescence	Medium	Medium
Seed index (000) gms	67.55 (high >60)	67.55 (high >60)



Form PB-10  
[See Rule 13(1)]

Serial No. 000008



## Government of Pakistan Plant Breeders' Rights Registry

### CERTIFICATE OF PLANT VARIETY PROTECTION

Registration No. 08-SF/44-2021	Dated:	21-12-2021
Crop: Sunflower	Denomination of Variety:	ORISUN-516
Type: New Plant Variety	Conventional/GMC:	Conventional
OP/Hybrid: Hybrid	Local/Exotic:	Local

As declared

- That Muhammad Aftab, Dr. Sajida Habib, Tariq Mahmood, Muhammad Aslam, Dr. Rizwana Qamar, Fida Hussain, Hafiz Saad Bin Mustafa & Saleem Ur Rahman

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

#### **OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD**

آئل سیڈز ریسرچ انسٹیٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 21<sup>st</sup> day of December 2021 and expiring on the 20<sup>th</sup> day of December 2041



Registrar

*Hayatullah*

Date of Grant 28-09-2023

## 9. Application No.: PBRR-Sunflower-45/21

Name of the Applicant: Chief Scientist (ORI)

Institute: ORI, AARI

Name of Breeder(s):

i. Muhammad Aftab, Chief Scientist, Oil Seeds Research Institute, Faisalabad

ii. Dr. Sajida Habib, Senior Scientist, Oil Seeds Research Institute, Faisalabad

iii. Tariq Mahmood, Principal Scientist, Oil Seeds Research Institute, Faisalabad

iv. Muhammad Aslam, Scientific Officer, Oil Seeds Research Institute, Faisalabad

v. Dr. Rizwana Qamar, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vi. Fida Hussain, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vii. Hafiz Saad Bin Mustafa, Scientific Officer, Oil Seeds Research Institute, Faisalabad

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: Orisun-648

Crop: Sunflower (*Helianthus annuus* L.)

Type of Variety: Hybrid (F1)

Name of Initial Variety

(in case EDV): Not Applicable

Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Maturity days	Early to medium	Early to medium
Normal crop sowing season	Spring	Spring
Suitable for sowing	All sowing	All sowing
Uniformity in maturity	Intermediate	Intermediate

<b>Seedling Characteristics</b>		
Seedling length cm (14 days)	8.0-10.0	8.0-10.0
Seedling anthocyanin		
Seedling hairiness	Medium	Medium
Seedling color	Green	Green
Hypocotyl anthocyanin	Absent	Absent
Anthocyanin color on margin of young leaves	Absent	Absent
<b>Plant/ Stem Characteristics</b>		
Main stem color at heading	Light Green	Light Green
Growth point	Yellow Green	Yellow Green
Stem anthocyanin	Absent	Absent
Pubescence at the top 5 cm	Medium	Medium
Stem pubescence length	Short	Short
Stem stiffness	Intermediate	Intermediate
Stem diameter (at mid) cm	3.4-3.6	3.4-3.6
Plant height at full flowering cm	145-154	150-163
Plant height at full flowering	Small to medium	Small to medium
Stem branching	Absent	Absent
length of internode cm (in central third of stem)	10.0-11.0	9.0-12.0
length of internode (in central third of stem)	Medium	Medium
Percent stalk breakage	Nil	Nil
Percent root lodging	Nil	Nil
Type of root	Tap	Tap
<b>Leaf Characteristics</b>		
Leaves/plant	25-27	25-30
Leaf color	Green	Green
Leaf anthocyanin on margin of young leaves	Absent	Absent
leaf attitude	Horizontal	Horizontal/ descending
Leaf surface	Smooth	Smooth
Leaf pubescence	Sparse	Sparse

Leaf pubescence length	Short	Short
Leaf length cm	28.0-31.0 (long)	21.0-24.0
Leaf width cm	31-33 (broad)	21.0-25.0
Leaf size	Large	Large
Petiole length cm (at bottom)	19.0-21.0	19.0-21.1
Leaf petiole anthocyanin	Moderate	Weak to Moderate
Leaf angle between lower part of petiole stem	Large	Large
Leaf shape	Cordate	Cordate
Leaf shape of distal part	Acuminate	Broad
Leaf apex	Acute	Acute
Leaf base shape	Auriculate	Auriculate
Leaf auricles	Large	Large
Leaf wings	None	None
Leaf margin	Dentate	Dentate
Leaf margin indentation depth	Medium	Shallow to Medium
Leaf margin indentation regularity	Regular	Regular
Leaf margin serration (fineness)	Coarse	Coarse
Leaf venation	Reticulate	Reticulate
Leaf angle of lowest/ lateral veins	Acute	Acute
Leaf height of tip of the blade compared to insertion of petiole	Medium	Very low
Leaf habit of petiole	Semi erect	Semi erect
Leaf petiole pubescence	Weak	Weak
Leaf senescence	Medium	Medium
Leaf blistering	Absent	Absent
Leaf glossiness	Absent	Absent
Leaf shape of cross section	Weakly concave	Weakly concave
Number of leaves on main stem	High >25	High >25
<b>Flower Characteristics</b>		
Days to flowering 50%	70-75 (medium)	70-75 (medium)
Bud diameter (full size stage) cm	13.0-15.0	
Bract tightness on bud	Intermediate	Intermediate

Flowering Uniformity	Intermediate	Intermediate
Ray floret density/ number	Sparse, few	Sparse, few
Ray floret shape	Narrow Ovate	Narrow Ovate
Ray floret length cm	7.0-7.5	6.5-7.0
Ray floret width cm	2.0-2.3	2.0-2.3
Ray floret color	Light Yellow	Yellow
Ray floret size	Medium	Medium
Ray floret petal curling	Flat Petal	Flat Petal
Disc flower color	Yellow	Yellow
Stigma color	Yellow	Yellow
Disc flower anthocyanin of stigma	Absent	Absent
Disc flower production of pollen	Good	Good
Pollen color	Yellow	Yellow
Extra floral nectaries	Absent	Absent
<b>Head Characteristics</b>		
Bract length on bud cm	5.5-6.5	5.5-6.5
Heads/ plant	Single	Single
Head size/ diameter cm	Large >20	Large >20
Head shape of grain side	Weakly Convex (Deshape)	Weakly Convex (Deshape)
Head shape uniformity	Intermediate	Intermediate
Head secondary shape of grain size	Weakly Convex (Deshape)	Weakly Convex (Deshape)
Head depth	Deep	Deep
Receptacle thickness cm	4.0-4.3	4.0-4.3
Head pubescence	Medium	Medium
Involucel length	Long	Long
Involucel width	Wide	Wide
Involucel anthocyanin	Absent	Absent
Head bracts (on back)	Many	Many
Bract shape	Clearly	Clearly
Bract size	Large	Large
Bract length of tip	Very Long	Very Long

Bract green color of outside	Medium	Medium
Bract anthocyanin	Absent	Absent
Bract attitude in relation of head	Slightly embracing	Slightly embracing
Bract pubescence	Sparse	Sparse
Bract pubescence length	Short	Short
Head attitude	Half turned down with curved stem	Turned down with slightly curved stem
Head angle	135°	135°-180°
Threshability	Moderate	Moderate
Shattering	Low	Low
<b>Seed Characteristics</b>		
Seed weight/ head gms	71	
Seed shape	Narrow to Broad Ovoid	Narrow to Broad Ovoid
Seed size	Medium	Medium
Seed length mm	12.3-12.9 (medium)	12.3-12.9 (medium)
Seed width mm	5.0-6.14 (medium)	5.01-6.14 (medium)
Seed thickness mm	3.49-3.98 (medium)	3.49-3.98 (medium)
Seed main color	Dark Brown	Dark Brown
Seed position of strips	Both	Both
Seed strips on margin	Weakly expressed	Weakly expressed
Seed strips between margin	Weakly expressed	Weakly expressed
Seed primary color of strips	Whitish Grey	Whitish Grey
Seed spots/mottling on pericarp	Absent	Absent
Seed pericarp thickness	Medium	Medium
Seed cross section shape	Ovoid	Ovoid
Seed pubescence	Medium	Medium
Seed index (000) gms	68.05 (high >60)	68.05 (high >60)



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000009



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No. 09-SF/45-2021

Dated: 21-12-2021

Crop: Sunflower

Denomination of Variety: ORISUN-648

Type: Registered

Conventional/GMC: Conventional

OP/Hybrid: Hybrid

Local/Exotic: Local

As declared

- That Muhammad Aftab, Dr. Sajida Habib, Tariq Mahmood, Muhammad Aslam, Dr. Rizwana Qamar, Fida Hussain, Ali Hassan Khan & Hafiz Saad Bin Mustafa

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD**

آئل سیڈز ریسرچ انسٹیٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 21<sup>st</sup> day of December 2021 and expiring on the 20<sup>th</sup> day of December 2041



Registrar

Date of Grant 28-09-2023

*Hayatullah*

## 10. Application No.: PBRR-Sunflower-46/21

Name of the Applicant: Chief Scientist (ORI)

Institute: ORI, AARI

Name of Breeder(s):

i. Muhammad Aftab, Chief Scientist, Oil Seeds Research Institute, Faisalabad

ii. Dr. Sajida Habib, Senior Scientist, Oil Seeds Research Institute, Faisalabad

iii. Tariq Mahmood, Principal Scientist, Oil Seeds Research Institute, Faisalabad

iv. Dr. Rizwana Qamar, Scientific Officer, Oil Seeds Research Institute, Faisalabad

v. Fida Hussain, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vi. Dr. Ejaz ul Hassan, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vii. Hafiz Saad Bin Mustafa, Scientific Officer, Oil Seeds Research Institute, Faisalabad

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: Orisun-675

Crop: Sunflower (*Helianthus annuus* L.)

Type of Variety: Hybrid (F1)

Name of Initial Variety  
(in case EDV): Not Applicable

Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Maturity days	Early	Early
Normal crop sowing season	Spring	Spring
Suitable for sowing	All sowing	All sowing
Uniformity in maturity	Uniform	Uniform
<b>Seedling Characteristics</b>		

Seedling length cm (14 days)	8.0-10.0	8.0-10.0
Seedling hairiness	Medium	Medium
Seedling color	Green	Green
Hypocotyl anthocyanin	Medium	Medium
Anthocyanin color on margin of young leaves	Absent	Absent
Size of Cotyledon	Medium	Medium
Shape of Cotyledon	Elliptical	Elliptical
<b>Plant/ Stem Characteristics</b>		
Main stem color at heading	Light Green	Light Green
Growth point	Yellow Green	Yellow Green
Stem anthocyanin	Absent	Weak
Pubescence at the top 5 cm	Medium	Medium
Stem pubescence length	Short	Short
Stem stiffness	Intermediate	Intermediate
Stem diameter (at mid) cm	2.6-2.8	2.6-2.8
Plant height at full flowering cm	180-195	180-195
Plant height at full flowering		
Stem branching	Absent	Absent
Natural position of highest lateral head to the central head		NA
length of internode (in central third of stem)	Medium	Medium
Percent stalk breakage	Nil	Nil
Percent root lodging	Nil	Nil
Type of root	Tap	Tap
<b>Leaf Characteristics</b>		
Leaves/plant	24-28	35-40
Leaf color	Green	Green
Leaf anthocyanin on margin of young leaves	Absent	Absent
leaf attitude	Horizontal	Slightly Descending
Leaf surface	Smooth	Smooth
Leaf pubescence	Absent	Absent

Leaf pubescence length	Absent	Absent
Leaf length cm	21.0-22.0 (medium)	25.0-27.0
Leaf width cm	20.0-21.0 (medium)	25.0-29.0
Leaf size	Medium	Large
Petiole length cm (at bottom)	11.0-12.0	20.0-21.0
Leaf petiole anthocyanin	Moderate	Moderate
Leaf angle between lower part of petiole stem	Large	Large
Leaf shape	Cordate	Cordate
Leaf shape of distal part		
Leaf apex	Acuminate	Acute to Acuminate
Leaf base shape	Auriculate	Auriculate
Leaf auricles	Medium	Medium
Leaf wings	Medium	
Leaf margin	Dentate	Dentate
Leaf margin indentation depth	Shallow	Shallow
Leaf margin indentation regularity	Irregular	Regular
Leaf margin serration (fineness)	Medium	Medium
Leaf venation	Reticulate	Reticulate
Leaf angle of lowest/ lateral veins	Obtuse	Obtuse
Leaf height of tip of the blade compared to insertion of petiole	Very low	High
Leaf habit of petiole	Semi erect	Horizontal
Leaf petiole pubescence	Medium	Medium
Leaf senescence	Medium	Medium
Leaf blistering		
Leaf glossiness	Absent	Absent
Leaf shape of cross section	Weakly concave	Flat to Weakly convex
Number of leaves on main stem	Medium (21-25)	High >25
<b>Flower Characteristics</b>		
Days to flowering 50%	65-70 (medium)	65-70 (medium)
Bud diameter (full size stage) cm		

Bract tightness on bud	Intermediate	Intermediate
Flowering Uniformity	Uniform	Uniform
Ray floret density/ number	Medium	Medium
Ray floret shape	Broad Ovate	Broad Ovate
Ray floret length cm	5.0-6.0	6.5-7.5
Ray floret width cm	2.0-2.1	2.0-2.5
Ray floret color	Medium Yellow	Medium Yellow
Ray floret size	Medium	Large
Ray floret petal curling	Flat Petal	Flat Petal
Disc flower color	Yellow	Yellow
Stigma color	Yellow	Yellow
Disc flower anthocyanin of stigma	Absent	Absent
Disc flower production of pollen	Good	Good
Pollen color	Yellow	Yellow
Extra floral nectaries	Absent	Absent
<b>Head Characteristics</b>		
Bract length on bud cm	1.0-1.5	5.0-5.5
Heads/ plant	Single	Single
Head size/ diameter cm	Medium (16-18)	Medium (15-20)
Head shape of grain side	Weakly Convex	Strongly Convex
Head shape uniformity	Uniform	Uniform
Head secondary shape of grain size		
Head depth	Medium	Medium to deep
Receptacle thickness cm		
Head pubescence	Medium	Medium
Involucer length	Medium	Long
Involucer width	Medium	Wide
Involucer anthocyanin	Absent	Absent
Head bracts (on back)	1-2	1-2
Bract shape	Clearly rounded	Clearly rounded
Bract size	Medium	Medium

Bract length of tip	Medium	Large
Bract green color of outside	Medium	Medium
Bract anthocyanin	Absent	Absent
Bract attitude in relation of head	Slightly embracing	Slightly embracing
Bract pubescence	Sparse	Sparse
Bract pubescence length	Short	Short
Head attitude	Half turned down with curved stem	Half turned down with slightly curved stem
Head angle		
Threshability	Moderate	Moderate
Shattering	Low	Low
<b>Seed Characteristics</b>		
Seed weight/ head gms		80-90
Seed shape	Broad Ovoid	Broad Ovoid
Seed size	Small	Medium
Seed length mm	9.0-9.2 (medium)	9.0-9.2 (medium)
Seed width mm	4.0-4.1 (medium)	4.0-4.1 (medium)
Seed thickness mm	3.4-3.44 (medium)	3.4-3.44 (medium)
Seed main color	Black	Black
Seed position of strips	Both	Both
Seed spots/mottling on pericarp	Absent	Absent
Seed pericarp thickness		Medium
Seed cross section shape		Flat
Seed pubescence		Dense
Seed index (000) gms	55-60	55-60 (medium)



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000010



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No. 10-SF/46-2021	Dated:	21-12-2021
Crop: Sunflower	Denomination of Variety: ORISUN-675	
Type: Registered	Conventional/GMC: Conventional	
OP/Hybrid: Hybrid	Local/Exotic: Local	

As declared

- That Muhammad Aftab, Dr. Sajida Habib, Tariq Mahmood, Dr. Rizwana Qamar, Fida Hussain, Dr. Ejaz Ul Hassan & Hafiz Saad Bin Mustafa

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD**

آئل سیڈز ریسرچ انسٹیٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 21<sup>st</sup> day of December 2021 and expiring on the 20<sup>th</sup> day of December 2041



Registrar

Date of Grant 28-09-2023

*Hayatul*

## 11. Application No.: PBRR-Sunflower-47/21

Name of the Applicant: Chief Scientist (ORI)

Institute: ORI, AARI

Name of Breeder(s):

i. Muhammad Aftab, Chief Scientist, Oil Seeds Research Institute, Faisalabad

ii. Dr. Sajida Habib, Senior Scientist, Oil Seeds Research Institute, Faisalabad

iii. Tariq Mahmood, Principal Scientist, Oil Seeds Research Institute, Faisalabad

iv. Muhammad Aslam, Scientific Officer, Oil Seeds Research Institute, Faisalabad

v. Dr. Rizwana Qamar, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vi. Fida Hussain, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vii. Hafiz Saad Bin Mustafa, Scientific Officer, Oil Seeds Research Institute, Faisalabad

viii. Dr. Ejaz ul Hassan, Scientific Officer, Oil Seeds Research Institute, Faisalabad

xi. Muhammad Anwar, Scientific Officer, Oil Seeds Research Institute, Faisalabad

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: Orisun-701

Crop: Sunflower (*Helianthus annuus* L.)

Type of Variety: Hybrid (F1)

Name of Initial Variety

(in case EDV): Not Applicable

### Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Maturity days	Medium to late	Medium to late

Normal crop sowing season	Spring	Spring
Suitable for sowing	All sowing	All sowing
Uniformity in maturity	Uniform	Uniform
<b>Seedling Characteristics</b>		
Seedling length cm (14 days)	10.0-11.0	10.0-10.5
Seedling hariness	Medium	Medium
Seedling color	Green	Green
Hypocotyl anthocyanin	Absent	Absent
Anthocyanin color on margin of young leaves	Absent	Absent
Size of Cotyledon	Medium	Medium
Shape of Cotyledon	Elliptical	Elliptical
<b>Plant/ Stem Characteristics</b>		
Main stem color at heading	Light Green	Light Green
Growth point	Yellow Green	Yellow Green
Stem anthocyanin	Absent	Absent
Pubescence at the top 5 cm	Medium	Medium
Stem pubescence length	Short	Short
Stem stiffness	Intermediate	Intermediate
Stem diameter (at mid) cm	2.8-3.0	2.8-3.0
Plant height at full flowering cm	200-215	190-205
Plant height at full flowering		
Stem branching	Absent	Absent
Natural position of hightest lateral head to the central head		NA
length of internode (in central third of stem)	Medium	Medium
Percent stalk breakage	1-2%	1-2%
Percent root lodging	Nil	Nil
Type of root	Tap	Tap
<b>Leaf Characteristics</b>		
Leaves/plant	32-35	30-32
Leaf color	Green	Green

Leaf anthocyanin on margin of young leaves	Absent	Absent
leaf attitude	Semi Erect	Semi Erect
Leaf surface	Smooth	Smooth
Leaf pubescence	Medium	Medium
Leaf pubescence length	Short	Short
Leaf length cm	20-28	26.0-28.0
Leaf width cm	20-24	26.0-27.0
Leaf size	Large	Large
Petiole length cm (at bottom)	12-15	14-18
Leaf petiole anthocyanin	Absent	Absent
Leaf angle between lower part of petiole stem	Medium	Medium
Leaf shape	Cordate	Cordate
Leaf shape of distal part		
Leaf apex	Acuminate	Acuminate
Leaf base shape	Auriculate	Auriculate
Leaf auricles	Large	Large
Leaf wings	None	
Leaf margin	Dentate	Dentate
Leaf margin indentation depth	Shallow	Shallow
Leaf margin indentation regularity	Irregular	Regular
Leaf margin serration (fineness)	Coarse	Coarse
Leaf venation	Reticulate	Reticulate
Leaf angle of lowest/ lateral veins	Acute	Right
Leaf height of tip of the blade compared to insertion of petiole	Low	Low
Leaf habit of petiole	Semi Erect to Horizontal	Semi Erect
Leaf petiole pubescence	Medium	Medium
Leaf senescence	Late	Late
Leaf glossiness	Absent	Absent
Leaf shape of cross section	Weakly Convex	Weakly Concave
Number of leaves on main stem	32-35 high >25	32-35 high >25

<b>Flower Characteristics</b>		
Days to flowering 50%	75-85 (late)	75-85 (late)
Bud diameter (full size stage) cm		
Bract tightness on bud	Intermediate	Intermediate
Flowering Uniformity	Uniform	Uniform
Ray floret density/ number	Dense	Dense
Ray floret shape	Narrow Ovate	Narrow Ovate
Ray floret length cm	8.0-9.0	6.5-7.4
Ray floret width cm	2.0-2.5	2.0-2.3
Ray floret color	Yellow	Yellow
Ray floret size	Large	Large
Ray floret petal curling	Flat Petal	Flat Petal
Disc flower color	Yellow	Yellow
Stigma color	Yellow	Yellow
Disc flower anthocyanin of stigma	Absent	Absent
Disc flower production of pollen	Medium	Medium
Pollen color	Yellow	Yellow
Extra floral nectaries	Absent	Absent
<b>Head Characteristics</b>		
Bract length on bud cm	3.0-4.0	3.0-4.0
Heads/ plant	Single	Single
Head size/ diameter cm	Large >20	Large >20
Head shape of grain side	Weakly Convex	Weakly Convex
Head shape uniformity	Uniform	Uniform
Head depth	Medium	Medium
Receptacle thickness cm		
Head pubescence	Medium	Medium
Involucer length	Medium	Medium
Involucer width	Medium	Medium
Involucer anthocyanin	Absent	Absent
Head bracts (on back)	Many	Many

Bract shape	Convergent	Rounded
Bract size	Large	Large
Bract length of tip	Long	Long
Bract green color of outside	Medium	Medium
Bract anthocyanin	Absent	Absent
Bract attitude in relation of head	Slightly embracing	Slightly embracing
Bract pubescence	Medium	Medium
Bract pubescence length	Short	Short
Head attitude	Half Turned	Half Turned
Threshability	Moderate	Moderate
Shattering	Medium	Medium
<b>Seed Characteristics</b>		
Seed weight/ head gms		120-140
Seed shape	Broad Ovoid	Broad Ovoid
Seed size	Medium	Medium
Seed length mm	13.0-14.0 (medium)	10.9-11.24
Seed width mm	5.5-6.75 (medium)	5.94-6.18
Seed thickness mm	3.0-3.9 (medium)	3.32-4.03
Seed main color	Black	Grayish Black
Seed position of strips	Both	Both
Seed spots/mottling on pericarp	Absent	Absent
Seed pericarp thickness		Medium
Seed cross section shape		Ovoid
Seed pubescence		Medium
Seed index (000) gms	55-60 (medium)	55-60 (medium)



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000011



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No. 11-SF/47-2021	Dated: 21-12-2021
Crop: Sunflower	Denomination of Variety: ORISUN-701
Type: Registered	Conventional/GMC: Conventional
OP/Hybrid: Hybrid	Local/Exotic: Local

As declared

- That Muhammad Aftab, Dr. Sajida Habib, Tariq Mahmood, Muhammad Aslam, Dr. Rizwana Qamar, Fida Hussain, Hafiz Saad Bin Mustafa, Dr. Ejaz Ul Hassan, & Muhammad Anwar has/have developed new plant variety and also that they are the true breeder(s).
- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD**

آئل سیڈز ریسرچ انسٹیٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 21<sup>st</sup> day of December 2021 and expiring on the 20<sup>th</sup> day of December 2041



Registrar

Date of Grant 28-09-2023

*Hayatullah*

**12. Application No.: PBRR-Canola-56/22**

Name of the Applicant: Chief Scientist (ORI)

Institute: ORI, AARI

Name of Breeder(s):

i. Muhammad Aftab, Chief Scientist, Oil Seeds Research Institute, Faisalabad

ii. Tariq Mahmood, Principal Scientist, Oil Seeds Research Institute, Faisalabad

iii. Hafiz Saad Bin Mustafa, Scientific Officer, Oil Seeds Research Institute, Faisalabad

iv. Dr. Sundas Shahzad, Senior Scientist, Oil Seeds Research Institute, Faisalabad

v. Dr. Mariam Hassan, Scientific Officer, Oil Seeds Research Institute, Faisalabad

vi. Huma Qamar, Scientific Officer, Oil Seeds Research Institute, Faisalabad

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of Variety: Rachna Canola

Crop: Canola (*Brassica napus* L.)

Type of Variety: OPV

Name of Initial Variety

(in case EDV): Not Applicable

Salient Features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Maturity duration	Medium	
Crop Season	Rabi	Rabi
Sowing time	Mid October	October
<b>Seedling Characteristics</b>		
Growth habit	Erect	Erect
Seedling length cm	3.0-3.5	4.0-4.3
Cotyledon length mm	9-11	9.0-13.0
Cotyledon width mm	18-19	17.0-19.0
Seedling anthocyanin	Medium	Medium
<b>Plant Characteristics</b>		
Plant height cm	200-230	195-210
Plant type	determinate	determinate

Growth habit	Intermediate	Intermediate
Plant color	Dark Green	Dark Green
<b>Leaf Characteristics</b>		
Leaf color	Dark Green	Dark Green
Leaf attitude	Semi Erect	Semi Erect
Leaf size	Large	Large
Leaf length cm	27-31	25.0-29.5
Leaf width cm	16-19	17.0-18.0
Petiole base	Broad	Broad
Petiole length cm	19-25	20.0-30.0
Leaf lobing	Deeply lobed	Deeply lobed
Leaf Margin indent	Medium	Medium
Terminal segment	Very Large	Very Large
Leaf hair	Absent	Absent
Leaf auricles	Present (medium)	Partially present
Leaf anthocyanin	Absent	Absent
Leaf attachment	Stalked	Stalked
<b>Stem characteristics</b>		
Stem shape	Roundish	Round
Stem thickness mm	13-18	15.0-18.0
Stem stiffness	Medium	Medium
Stem pith	Hollow	Hollow
Ramification	Low level	Low level
<b>Flower Characteristics</b>		
Days to flower 50%	80-85	80-85
Flowering duration		Medium
Petal color	Yellow	Yellow
Anther dotting	absent	absent
Pollination	Self	Self
<b>Pod Characteristics</b>		
Pod shape	Flat	Flat

Pod anthocyanin	Absent	Absent
Pod attitude	Horizontal	Horizontal
Pod density	Lax	Lax to medium
Pod length mm	60-70	60.0-67.0
Pod Width mm	6.0-7.0	6.0-7.0
Pedicle length	25-32 (mm)	25.0-30.0 (mm)
Beak shape	Conical	Conical
Beak length mm	11-15	13.0-17.0
Shattering	High	High
<b>Seed Characteristics</b>		
Seed color	Blackish	Blackish
Seed size	Medium	Medium to bold
Reticulation	absent	absent
<b>RESISTANT TO</b>		
Lodging		Suseptible



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000012



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No.	12-CN/56-2022	Dated:	25-05-2022
Crop:	Canola	Denomination of Variety:	Rachna Canola
Type:	Registered	Conventional/GMC:	Conventional
OP/Hybrid:	OP	Local/Exotic:	Local

As declared

- That Muhammad Aftab, Tariq Mahmood, Hafiz Saad Bin Mustafa, Dr. Sundas Shahzad, Dr. Mariam Hassan & Huma Qamar

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD**

آئل سیڈز ریسرچ انسٹی ٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 25<sup>th</sup> day of May 2022 and expiring on the 24<sup>th</sup> day of May 2042



Registrar

Date of Grant 28-09-2023

*Hayatullah*

**13. Application No.: PBRR-Rice-59/22**

Name of the applicant: Principal Scientist, SSRI, Pindi Bhattian

Institute: SSRI, Pindi Bhattian

Name of Breeder(s):

i. Muhammad Khalid Bhatti

ii. Dr. Ghulam Shabbir

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of variety: Al-Khalid Rice

Crop: Rice (*Oryza sativa* L.)

Type of the variety: OPV

Name of initial variety

(in case EDV): Not Applicable

Salient features:

CHARACTERISTICS	DESCRIPTION	
	1st Year	2nd Year
Seedling Color	Light green	Light green
Coleoptile color	colorless	colorless
Seedling length cm	35	35
Leaf Length cm Blade + Sheath	80-85	85-90
Leaf length of blade	Long	Long
Leaf anthocynin	Absent	Absent
Leaf width cm	0.9-1.2	1.0-1.2
Leaf width	Medium	Medium
Leaf pubescence	Absent	Absent
Leaf color	Green	Green
Leaf sheath color	Green	Green
Leaf senescence	Late	Late
Ligule color	Papery	Papery
Ligule length cm	2.4-2.8	2.4-2.5
Ligule shape	2-Cleft	2-Cleft
Collar color	Pale Green	Pale Green
Flag leaf attitude	Erect	Erect
Flag leaf length	36-45 cm	36-45 cm

Flag leaf width	1.1-1.2	1.1-1.2
Mature stem length cm	120-125	120-125
Stem attitude	Erect	Erect
Stem thickness cm	0.6	0.6
Stem stiffness	Very stiff	Very stiff
Tillers/plant	20	18
Internode color	yellow	yellow
no. of nodes/ stem	8	8
maturity straw color	lemon straw	lemon straw
Panicle length cm	30-35	30-33
Panicle length	very long	very long
Panicle type	compact	compact
Spikelet density	dense	dense
Spikelets/panicle	116	114
Branches/ panicle	profuse	profuse
Secondary Branches	present	present
Intensity of secondary branches	strong	strong
Attitude of Branches	erect to semi erect	erect to semi erect
Panicle exeration	moderately exerted	moderately exerted
Panicle curvature of main axis	Semi straight	Semi straight
Awning at maturity	Absent	Absent
Shattering	very low	very low
Threshability	intermediate	intermediate
Seed Awning	absent	absent
Apiculus color (maturity)	straw	straw
Husk color	straw	straw
Husk pigment	absent	absent
Husk pubescene	sparse	sparse
pubescene length	short	short
Seed shape	semi crescent	semi crescent
Seed length mm	15.0-16.2	15.0-16.2

Seed width mm	2.20-2.22	2.20-2.22
Seed thickness mm	2-2.40	2-2.40
1000 seed weight gm	32	33
Strile lema length mm	3.0-4.5	3.0-4.5
Sterile lema color	Straw	Straw
Seed size	extra long	extra long
Lodging	high tolerant	high tolerant
Kernal length mm	10	10
Kernal width mm	2	2
Kernal color	off-white	off-white
Kernal appearence	translucent	translucent
Chalkiness	absent	absent
Kernal quality	fine	fine



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000012



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No.	12-CN/56-2022	Dated:	25-05-2022
Crop:	Canola	Denomination of Variety:	Rachna Canola
Type:	Registered	Conventional/GMC:	Conventional
OP/Hybrid:	OP	Local/Exotic:	Local

As declared

- That Muhammad Aftab, Tariq Mahmood, Hafiz Saad Bin Mustafa, Dr. Sundas Shahzad, Dr. Mariam Hassan & Huma Qamar

has/have developed new plant variety and also that they are the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**OILSEEDS RESEARCH INSTITUTE, AARI, FAISALABAD**

آئل سیڈز ریسرچ انسٹی ٹیوٹ، اے اے آر آئی، فیصل آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 25<sup>th</sup> day of May 2022 and expiring on the 24<sup>th</sup> day of May 2042



Registrar

Date of Grant 28-09-2023

*Hayatullah*

**14. Application No.: PBRR-Wheat-60/22**

Name of the applicant: NARC, PARC, ISLAMABAD

Institute: NARC, PARC, ISLAMABAD

Name of Breeder(s):

- i. Dr. Maqsood Qamar, D-040, Wheat Program, CSI, NARC, Islamabad
- ii. Mrs. Sundas Waqar, D-041, Wheat Program, CSI, NARC, Islamabad
- iii. Dr. Muhammad Shahzad Ahmad, D-140, Wheat Program, CSI, NARC, Islamabad
- iv. Syed Haidar Abbas, D-043, Wheat Program, CSI, NARC, Islamabad
- v. Dr. Zahid Mehmood, D-042, Wheat Program, CSI, NARC, Islamabad
- vi. Dr. Imtiaz Hussain, D-030, Wheat Program, CSI, NARC, Islamabad
- vii. Dr. Sikander Khan Tanveer, D-049, Wheat Program, CSI, NARC, Islamabad

Name of Co-breeder(s):

Application for: New Plant Variety

Denomination of variety: NARC SUPER

Crop: Wheat (*Triticum aestivum* L.)

Type of variety: OPV

Name of initial variety  
(in case EDV): Not Applicable

Salient features:

CHARACTERISTICS	DESCRIPTION
Maturity Duration	Medium
<b>SEEDLING CHARACTERISTICS</b>	
Growth habit	Semi erect
Coleoptile color	White
Seedling anthocyanin	Absent
<b>PLANT CHARACTERISTICS</b>	
Plant height (cm)	105

Color booting stage	Green
<b>STEM CHARACTERISTICS</b>	
Stem anthocyanin	Absent
Stem waxy bloom	Medium
Stem wall thickness	Thin
Stem stiffness	Intermediate
Stem diameter mm	4.5
Peduncle length cm	37.5
Productive tillers/m	138
Nodes/Stem	5
Straw Color	Yellowish White
Lodging	Medium
<b>FLAG LEAF CHARACTERISTICS</b>	
Flag leaf attitude	Recurved
Flag leaf twist	Weak
Length cm	27.83
Width cm	1.77
Sheath wax	Medium
Sheath hairiness	Absent
Auricle hairiness	Medium
Auricle anthocyanin	Absent
<b>EAR CHARACTERISTICS</b>	
Ear emergence	95
Ear size	Medium
Length cm	11.5
Width cm	1.25
Wax at anthesis	Medium
Color at maturity	Yellowish White
Ear shape	Taping
Ear density	Lax
Super numerary spikelets	Absent

Speltoids	Absent
Shattering	Low
Ear kink/twist	Medium
Ear Awnedness	Awned
Awn distribution	Whole
Awn length	Medium
Awn color	Yellowish White
Awn habit	Horizontal
Anther Color	Yellow
Rachis hairs apical	Medium
Rachis hairs margin	Medium
Rachis length cm	11
Rachis width mm	3
No. of segments	21
<b>GLUME CHARACTERISTICS</b>	
Glume length mm	11.5
Glume width Size mm	4.5
Glume length Size	Medium
Glume width size	Medium
Lower glume shape	Broad Flat
Glume attachment	Medium
Glume Pubescence	Absent
Glume surface	Rough
Lower glume shoulder shape	Sloping
Lower glume shoulder width	Narrow
Beak length mm	5
Lower glume beak shape	Curved and Humped
Lower glume Beak Size	Medium
Beak spicules	Present
Keel spicules	3
Glume internal hair	Medium

Glume internal imprint	Medium
<b>SEED CHARACTERISTICS</b>	
Seed color	amber
Seed surface	Opaque
Seed shape	Ovate
Seed length mm	6.6
Seed width mm	3
Seed Thickness mm	2.5
Seed size	Medium
Seed brush	Medium
Seed Germ size	Medium
1000 seed weight	36.5
Seed groove	Intermediate
Seed/ Ear	45
Seed hardness	Medium
Average Yield	
Varitents	Nil



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000014



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No. 14-WT/60-2022	Dated: 11-08-2022
Crop: Wheat	Denomination of Variety: NARC Super
Type: Registered	Conventional/GMC: Conventional
OP/Hybrid: OP	Local/Exotic: Local

As declared

- That Dr. Maqsood Qamar, Mrs. Sundas Waqar, Dr. Muhammad Shahzad Ahmad, Syed Haider Abbas, Dr. Zahid Mehmood, Dr. Imtiaz Hussain & Dr. Sikander Khan Tanveer has/have developed new plant variety and also that they are the true breeder(s).
- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**PARC-NATIONAL AGRICULTURAL RESEARCH CENTER, ISLAMABAD**

پی اے آر سی - نیشنل ایگریکلچرل ریسرچ سنٹر، اسلام آباد

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 11<sup>th</sup> day of August 2022 and expiring on the 10<sup>th</sup> day of August 2042



Registrar

Date of Grant 28-09-2023

*Hayatullah*

**15. Application No.: PBRR-Maize-74/22**

Name of the applicant: Shafiq Ur Rehman  
 Institute: Kissan seed corporation  
 Name of Breeder(s):  
 Name of Co-breeder(s):  
 Application for: New Plant Variety  
 Denomination of variety: SB-319  
 Crop: Maize (*Zea mays*)  
 Type of the variety: Hybrid  
 Name of initial variety (in case EDV): Not Applicable

Salient features:

<b>CHARACTERISTICS</b>	<b>DESCRIPTION</b>
Maturity Duration	Medium
Sowing Time	Feb to Mar and July to Aug
<b>SEEDLING CHARACTERISTICS</b>	
Seedling length (cm)	3.4 to 3.6
Coleoptile's anthocyanin	Medium
First leaf colour	Dark Green
First leaf tip	Round
First leaf length (mm)	5.2 to 5.3
First leaf width (mm)	1.5 to 1.6
<b>PLANT CHARACTERISTICS FOR HYBRID AND OPEN POLLINATED VARIETIES ONLY</b>	
Plant length up to flag leaf	Long (>180 cm)
<b>STEM CHARACTERISTICS</b>	
Stem length (cm)	242-246
Taller than	CS-200 (cultivar)
Internodal length (cm)	15.5-16.0

Internodal diameter (cm)	1.6-1.7
Mid node anthocyanin	Absent
Stem tillering	Absent
Stem anthocyanin coloration of brace roots	Present
<b>LEAF CHARACTERISTICS</b>	
Leaf angle between blade and stem (on leaf just above upper ear)	wide (>45)
Leaf attitude of blade (on leaf just above upper ear)	Semi Erect
Leaf width of blade (leaf of upper ear)	Medium (8-9 cm)
<b>TASSEL CHARACTERISTICS</b>	
50% Tassel emergence (days)	55-60 days Late
50% Tassel emergence (days)	(>55 days)
Anthocyanin coloration at the base of glume (in middle third of main axis)	Absent
Anthocyanin coloration of glume excluding base (in middle third of main axis)	Absent
Angle between main axis and lateral branches	Wide (in lower third of tassel)
Attitude of lateral branches (in lower third of tassel)	Semi Erect
Anthocyanin coloration of anthers (in middle third of main axis on fresh anthers)	Absent
Density of spikelets (in middle third of tassel)	Dense
Tassel angle between main axis and lateral branches	wide (>45) (in lower third of tassel)
Tassel length (cm)	36-37
Tassel stalk length (cm)	8-9
Exsertion above flag leaf (cm)	44-46
No. of lateral branches	12-14
Lateral branches attitude	Dense
<b>FLOWER CHARACTERISTICS</b>	
Anther fertility	Normal
Pollen shading	Heavy

Anther color	Yellow
Pollen color	Yellow
Glume color	Green
<b>EAR CHARACTERISTICS</b>	
50% silk emergence(days)	59-63 Days
Silk color	Green
Insertion height (cm)	94-96
Peduncle length (cm)	8.0-8.5
Ear leafy extensions	Present, Short, Rare
Ear husk length	Medium
No. of husk blades	9-10
Ear shape	Slightly Conical
Ear length (cm)	19.5
Ear diameter (cm)	4.6
Seed rows/ear	14-16
Seed/row	40-43
Seed row arrangement	Slightly Curve
No. of ears/ plant	1-2
Ear weight (g)	191
Cob color	White
<b>SEED CHARACTERISTICS</b>	
Seed color	White
Seed row arrangment	
Seed tip color	White
Color of sides	White
Seed shape	Indented
Seed length (mm)	11.8
Seed width (mm)	9.3
Seed thickness (mm)	5
Seed type	Medium
Seed wax	Absent

Seed size	Bold
Seed weight/ear (g)	166
1000 Seed weight (g)	318
Grain. Cob ratio	87%
Yield/ ha.(MT)	10.2
Seed sweetness	Absent
Seed waxiness	Absent
Seed opaqueness	Absent
<b>Environmental Adaptability</b>	
<b>Distinguishing Characteristics:</b>	(i) It is a tall hybrid with semi erect, broad, and long (more than normal as compare to other hybrids) a bit curved leaves with bold cobs at the middle of the plant, the husk cover become light purplish at the maturity with clearly differentiate it from other hybrids. (ii) Middle leaves above cobs are long, semi erect & over laping.



Government of Pakistan  
Plant Breeders' Rights Registry

Form PB-10  
[See Rule 13(1)]

Serial No. 000015



**CERTIFICATE OF PLANT VARIETY PROTECTION**

Registration No. 15-MZ/71-2022

Dated: 16-12-2022

Crop: Maize

Denomination of Variety: SB-319

Type: Enlisted

Conventional/GMC: Conventional

OP/Hybrid: Hybrid

Local/Exotic: Local

As declared

- That Shafique Ur Rehman

has/have developed new plant variety and also that he is the true breeder(s).

- By virtue of an application that has been made to grant plant variety protection rights and that plant variety has particularly been described with respect to its distinctive features and a suitable denomination.
- There is no objection to grant plant variety protection rights of the said variety under the Plant Breeders' Rights Act, 2016 in favour of:

**SHAFIQUE UR REHMAN, KISSAN SEED CORPORATION, SAHIWAL**

شفیق الرحمن، کسان سید کارپوریشن، ساہیوال

By virtue of this certificate, the above mentioned owner(s) of the rights have under the Plant Breeders' Rights Act, 2016, the exclusive right to produce, sell, market, distribute, import or export the variety (seed) or propagating material for a term of Twenty years starting from the 16<sup>th</sup> day of December 2022 and expiring on the 15<sup>th</sup> day of December 2042



Registrar

Date of Grant 28-09-2023

*Hayatullah*

## NEWS AND EVENTS

### NEW WHEAT VARIETIES RELEASED

Pakistan's objective to become self-sufficient in wheat production is supported by the registration of 31 new wheat varieties since 2021 to improve productivity, climate adaptability, and resistance to diseases in wheat germplasm. Yield improvement ranging from 5% to 20% and resistance to biotic and abiotic stresses is result of new varieties developed through evaluations of international nurseries and field trials. These initiatives are in line with Pakistan's Vision 2025 and Vision for Agriculture 2030, which highlights the significance of enhancing food and nutrition security through sustainable wheat production.

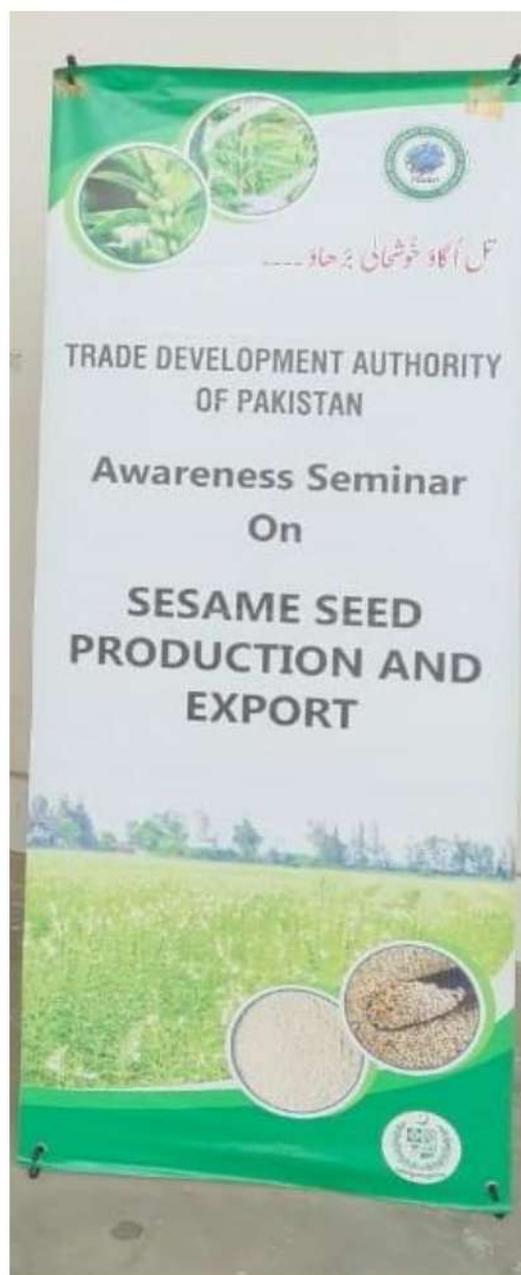


### PAK CHINA COOPERATION

A delegation from the Pakistan Hitech Hybrid Seed Association (PHHSA) set off on a week-long trip to China to explore potential partnerships with Chinese organizations for the joint development of new high-yield hybrid seed varieties of rice. According to PHHSA Chairman Shahzad Ali Malik, such a partnership could be advantageous for both nations. By utilizing the knowledge of Chinese specialists, the association intends to create hybrid seeds that possess desirable characteristics, including high yields, resistance to diseases, and adaptability to specific environmental conditions. These seeds can significantly increase agricultural output and support food security initiatives in Pakistan. This collaboration is anticipated to enhance the evolution of crop varieties and tackle the agricultural challenges faced by the country.

## SESAME SEED EXPORT

Pakistan experienced significant growth in sesame seed exports in 2022. One of the main contributing factors is the China-Pakistan Free Trade Agreement and favorable pricing in the Chinese market. During the first nine months of CY22, exports to China totaled \$59.09 million, indicating a 50% increase year-over-year. In 2022, China imported 39,533 tons of sesame seeds valued at \$59.09 million, reflecting a 22% increase in volume compared to 2021's 32,487 tons worth \$39.44 million. Sesame is an important oilseed crop recognized for its high-quality oil and protein content ranging from 50% to 58%. It thrives in hot, arid climates and is used across various industries, including food, confectionery, bakery products, soap, perfumes, vegetable oil, and carbon paper. With its high demand and potential for good pricing, more Pakistani farmers are inclining towards sesame cultivation.



### Reducing Import through Quality Seed

The nation needs to cultivate high-quality seeds to cut down an annual seed import expense of Rs. 50 billion, which will aid in strengthening the economy and help farmers thrive, emphasized Mr. Muhammad Azam, Director General Federal Seed Certification and Registration Department. While speaking at a seminar, he mentioned that the government has permitted the private sector to produce basic seeds as a means to lower the import expenditures, ultimately contributing to agricultural progress and ensuring food security in the country. He explained that the initiation of a digitized management information system (MIS) would

enhance the capabilities of seed companies and facilitate regulatory oversight, ensuring that farmers receive certified seeds. He welcomed suggestions from stake holders to improve the Seed Track and Trace System.



The directors of the department, Mr. Nazar Iqbal and Dr. Hayyat Ullah Tareen, stated that the MIS was introduced to monitor certified seeds at every stage and to deter the sale of substandard seeds. Rana Salman Mehmood, the president of the Seed Association of Pakistan (SAP), and General Secretary Bilal Gujjar remarked that this system would benefit seed companies and would be implemented gradually to ensure proper functioning. They urged that Rahim Yar Khan be designated as a ‘seed district’ given that 70 percent of the national seed production originates from there.

It was reported in March this year that the country’s corporate sector had collaborated to enhance the agricultural sector by initiating a pilot project aimed at doubling cotton production and boosting rice exports from the current level of approximately \$2.5 billion annually. The corporate sector had set up modern warehouses to manage post-harvest losses, appropriately grade crops, develop brands, and increase exports.

## **SEED INDUSTRY OF PAKISTAN**

Sir William Roberts served as the principal of the Punjab Agriculture College and Research Institute in Lyallpur (now known as the University of Agriculture, Faisalabad) from 1917 to 1925. Approximately a century ago, the government at that time granted land leases to

Sir Roberts in Khanewal (Peerowal) for the purpose of initiating wheat and cotton seed production. He resigned from his position at the college and founded the Roberts Seed Association along with Roberts Ginning Mills. The business prospered, and the Nawab of Bahawalpur granted him additional land for cultivation in Rahim Yar Khan. At one point, the Roberts family owned 13 ginning factories and dominated the seed industry in the region.

The Peerowal estate declined in the 1970s when the lease expired, leading to its transfer to the newly established Punjab Seed Corporation (PSC). Over time, influential elites took control of the Rahim Yar Khan estate. The PSC initially thrived in the late 1970s with the cotton revolution sparked by the introduction of new heat-resistant cotton varieties (NIAB-78, S-12). This period also saw the introduction of the Seed Act of 1976, positioning the PSC as the leading provider of certified seeds. Within ten years, annual cotton production surged from 3 million to 12 million bales. Consequently, the textile industry grew, reflecting a boost in the country's economy. Most operations of the PSC involved sharecroppers (mazar'een), who had formerly been employed by the Roberts Seed Association. As with many state-owned enterprises across the nation, the PSC lost control over a significant portion of land operations due to movement of the mazar'een to get ownership rights.

The seed crisis in Pakistan has worsened, even as the global seed revolution has reshaped agriculture. The country experienced notable achievements during the early Green Revolution with the rollout of Maxi-Pak wheat seed, which featured short-statured and input-responsive varieties. This advancement was succeeded by a transformation in cotton production during 1980s. In recent decades, maize production has increased nearly tenfold, attributed to the introduction of hybrid seeds. Additionally, rice yields have quadrupled thanks to improved seed varieties.

Seed industry of Pakistan has evolved significantly transforming from a public sector monopoly to private sector dominated sector. The country has also evolved its regulation with amendment of its Seed Act, 1976 in 2015. Moreover, the promulgation of the Plant Breeders' Rights (PBR) Act, 2016 has enabled legal rights in Pakistan for plant varietal developers. The Act aims to enhance investments in the seed sector and establish intellectual property rights. The PBR Registry is fully operational, and there is optimism that this will indeed lead to a new era for Pakistan's seed sector.

The seed certification system has been digitized with introduction of Blockchain technology-based MIS system. The digitized Track and Trace system minimizes human interaction and makes the system efficient and seed developer friendly.