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Plant Breeders' Rights Registry

Plant Breeders' Rights Journal




Official Journal of Plant Breeders' Rights Registry, Pakistan

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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

EDITORIAL

It is my pleasure to welcome to the first edition of Plant Breeders' Rights Journal. This will be a quarterly published data base and official communication from Plant Breeders' Rights (PBR) Registry. The Journal will be available in both published as well as electronic form. The detail information about regulations, eligibility and process for getting protection of Plant Breeders' Rights are available at official website of the Registry (www.pbrr.gov.pk).

Plant Breeders' Rights Act, 2016 and Plant Breeders' Rights Rules, 2018 provide protection against unauthorized use of a plant variety. To implement these regulations, the PBR Registry was set up under the Ministry of National Food Security and Research. The Registry is aimed to implement the PBR laws to encourage development of new plant varieties and to protect rights of breeders of such varieties. This is a significant addition in up-to-date seed legislation devised to establish a viable seed industry for food security by ensuring the availability of high-quality seeds and planting material to the farmers. The Registry will promote entrepreneurship by protecting investment in research and development for improved plant varieties.

The protection of Plant Breeders' Rights is currently available for novel varieties of Cotton, Maize, Wheat, Rice, Millet, Canola, Sunflower, Rapeseed, Potato, Barley, Groundnut, Chickpea, Banana, Olive and Citrus. The scope of the Registry is getting extended for more crops with gradual improvement in capacity of the registry.

The Plant Breeders Rights Registry is for betterment of Agriculture by involving researchers, seed companies, regulators and farmers. It is a start of the Plant Varietal Protection regime in Pakistan and hopefully will evolve with passage of time and contribution from all stakeholders.

Dr. HayatUllah Tareen
Registrar
Plant Breeders' Rights Registry
Mauve Area, G-9/4, Islamabad

Message from Director General, FSC&RD

I congratulate Plant Breeders Rights Registry for issuance of the varietal protection certificates to Plant breeders and issuance of this journal. I am hopeful that Plant Breeders Rights Journal will significantly contribute to the field of plant breeding in Pakistan. Although the information of the registered and protected varieties was available but there was not a single online or digital forum to acquire the information by the stakeholders. Despite challenges in the field of plant breeding and varietal registration/protection, this journal may help both the breeders and regulators to ensure novelty in newly bred accessions and to find diversity in already existing germplasm.

Federal Seed Certification and Registration Department (FSC&RD) is mandated to conduct Distinctness, Uniformity and Stability (DUS) to ensure the uniqueness of newly bred crop and fruit plant varieties. The department have recently strengthened its DUS system and have also acquired five acres land at NARC premises. The biotechnology laboratory has also upgraded to provide technical support to analyze and validate DNA profile of the plant varieties. The department have ISTA accredited laboratory to provide orange and blue certificates to support the seed industry for exporting the seed of promising varieties. FSC&RD has wide network of offices throughout the Pakistan for the provision of seed registration and seed/fruit plants certification services to public and private sector.

The Plant Breeder Rights Act, 2016 and its rules demands very close coordination between FSC&RD and Plant Breeders Rights Registry (PBRR). I am hopeful that both the departments will work hard to support the seed industry, protect investments in seed business and to ensure the provision of quality seed to the farmers. FSC&RD will provide its full support to the Registry.

Muhammad Azam Khan

Message from Chairman Seed Association of Pakistan

In Pakistan, the legal framework governing plant breeding rights is primarily regulated by the Plant Breeders' Rights Act 2016. This act provides an intellectual property right to plant breeders, protecting new plant varieties that are distinct, uniform, stable, and have undergone an official testing and registration process.

The Plant Breeders' Rights Act offers exclusive rights to breeders for a specified period of time, typically 20 years for most crops and 25 years for trees and vines. During this period, breeders can restrict others from producing, selling, importing, and exporting the protected variety without their permission. To obtain plant breeding rights in Pakistan, breeders must submit an application to the Plant Breeders' Rights Office, which is part of the Federal Seed Certification and Registration Department.

Once granted, plant breeding rights allow breeders to enforce their exclusive rights by taking legal action against any unauthorized use or infringement of their protected variety. It is important for breeders to prominently display the Plant Breeders' Rights logo and variety name to inform the public about the variety's protected status.

It is worth mentioning that the Plant Breeders' Rights Act in Pakistan is compliant with the International Union for the Protection of New Varieties of Plants (UPOV) conventions. UPOV is an international organization that sets standards for plant variety protection worldwide.

Plant breeding rights will encourage scientists and plant breeders to work hard and give farmers new varieties to get more yield that will make farmer community and our country more prosperous.

Mr. Muhammad Ather Iqbal

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THE PLANT BREEDERS' RIGHTS REGISTRY, PAKISTAN

VISION

Establishment of a viable seed industry for food security in Pakistan by ensuring availability of high- quality seeds and planting material to the farmers.

MISSION

To encourage the development of new plant varieties and to protect the rights of breeders of such varieties.

FUNCTIONS OF THE REGISTRY

i. Facilitate protection of new plant varieties

ii. Issue PBR certificate

iii. Maintenance of the register of protected plant varieties

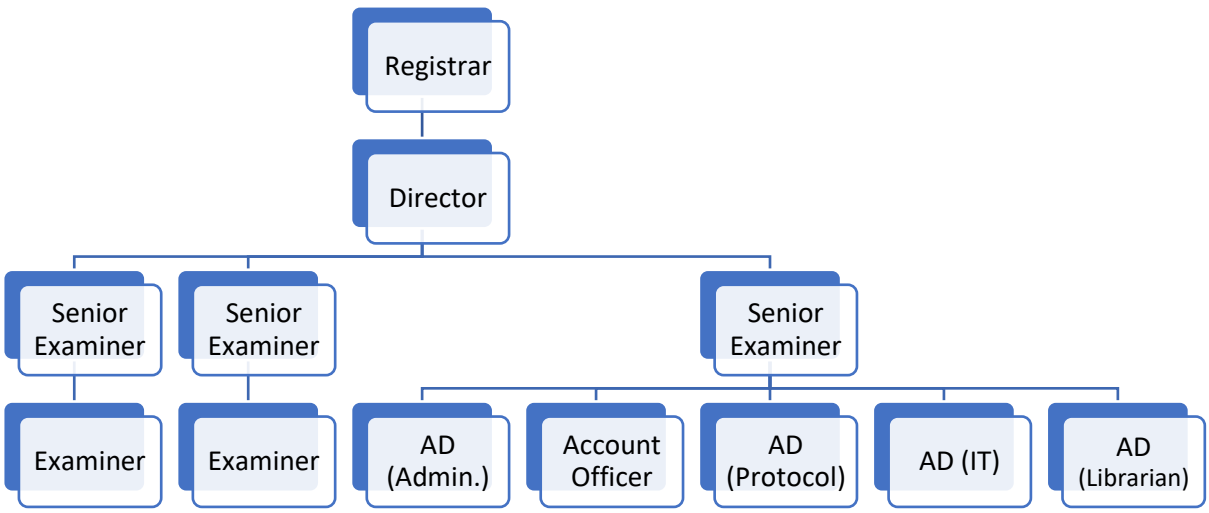
iv. Promote development of new varieties of plants

v. Protect the rights of the farmers and breeders

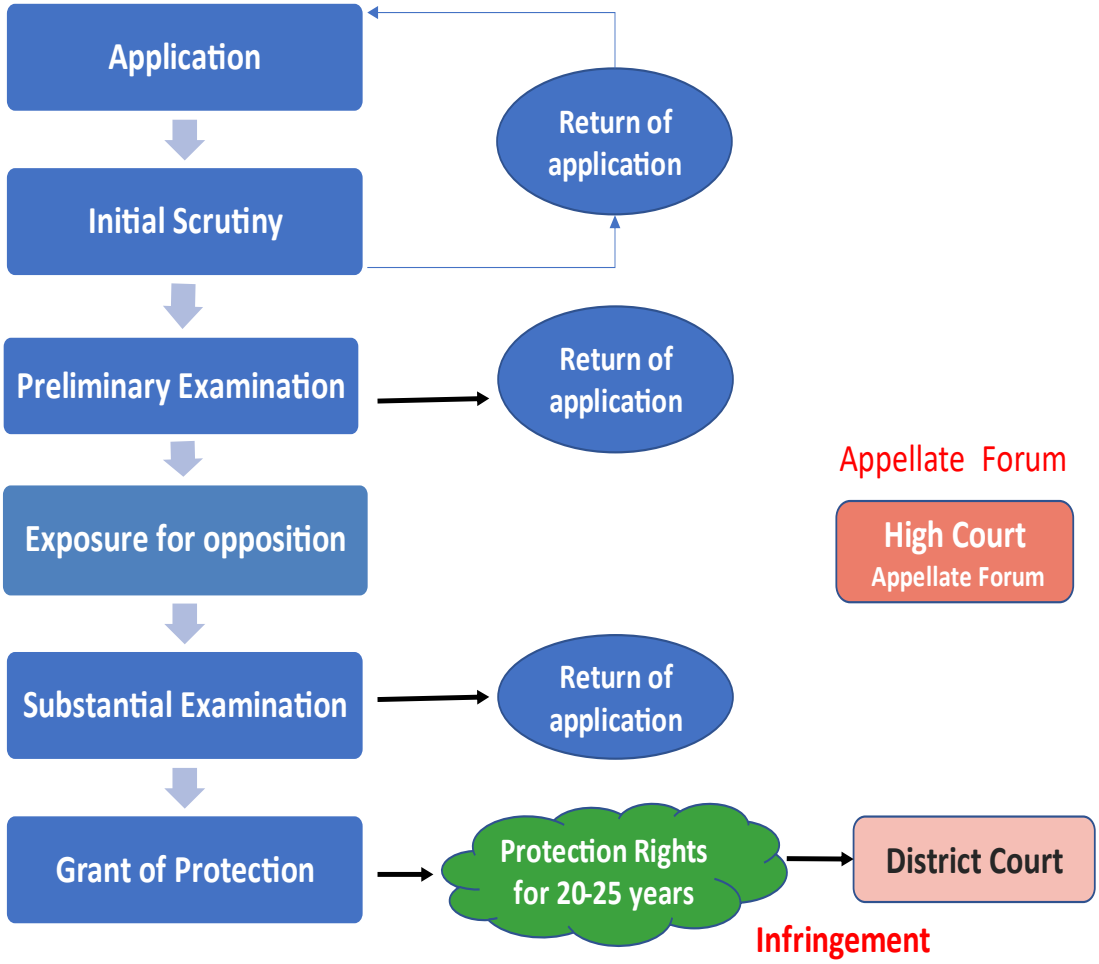
vi. Manage characterization and documentation of protected varieties

vii. Collect statistics with regard to plant varieties

ORGANOGRAM OF THE REGISTRY



WORKING OF THE REGISTRY



PLANT BREEDERS' RIGHTS AND THEIR EXCEPTIONS IN PAKISTAN

The Plant Breeders' Rights Act, 2016 provides following exclusive rights to the owner of a protected variety;

a. Offering for sale or selling or marketing of the reproductive or vegetative propagating material of the protected variety in Pakistan

b. Importing the reproductive or vegetative propagating material of the protected variety into Pakistan or exporting it from Pakistan

c. Conditioning or multiplying the reproductive or vegetative propagating material of the protected variety

d. Carrying out any of the acts identified in clauses a, b, and c in relation to an Essentially Derived Variety provided the protected variety is not itself an essentially derived Variety

e. Instigating or promoting any of the acts identified in clauses a, b, c and d

f. Authorizing any person io produce, sell, market or otherwise deal with a protected variety

g. Stocking for any of the purposes mentioned in clauses a-d

However, the Act provides following exceptions to the PBRs;

a. Any act done privately on a non-commercial basis

b. Any act done for scientific research or plant breeding as an initial source of variety for the purpose of creating other varieties provided that the authorization of the breeder of a protected variety shall be required where the repeated use of such variety as a parental line is necessary for commercial production of such other newly developed variety

c. Any act done for the purpose of breeding other plant varieties and any act referred to section 20 of the pbr act, 2016 in respect of such other plant varieties, except where such other plant varieties have been essentially derived from the protected plant variety

d. A farmer is entitled to save, use, sow, re-sow, exchange, share or sell his farm produce provided that the farmer shall not be entitled to sell seed of a protected variety on a commercial basis without complying with the requirements of seed act. 1976

e. Any exchange of propagating materials among farmers as may be specified in the regulations.

The Act enables Provisional protection which starts with filing of the application. In case of successfully getting the PBRs, for the period between filing of the application and the grant of a certificate, the owner of the certificate shall be entitled to equitable remuneration from any person who, during this period commercially exploited the propagating material of the variety.

Duration of the PBR Protection is;

- 25 years for trees and vines
- 20 years for all other plant species

ELIGIBILITY FOR THE PLANT BREEDERS' RIGHTS

Following can be the applicant for the Plant Breeders' Rights;

i. Developer of the plant variety
ii. Employer of the developer
iii. Successor of the applicant

Presently the PBR Registry is entertaining application for following plant species;

Sr. No.	Crop Name	Scientific Name
1.	Cotton	*Gossypium spp.*
2.	Maize	*Zea mays*
3.	Potato	*Solanum tuberosum*
4.	Canola	*Brassica napus*
5.	Sunflower	*Helianthus annuus*
6.	Wheat	*Triticum spp.*
7.	Barely	*Hordeum spp*
8.	Groundnut	*Arachis hypogaea*
9.	Chickpea	*Cicer arietinum*
10.	Banana	*Musa spp.*

However, an expansion in the scope of protectable species is in pipeline to facilitate breeders in term of protection of their varieties.

APPLYING FOR THE PLANT BREEDERS' RIGHTS

PRE-REQUISITES OF THE APPLICATION

An application for the PBRs has to be made on PB-1 form along with;

- Seed sample
- DNA profile
- Application fee

PROCESSING OF THE APPLICATION

CRITERIA FOR GETTING THE PBRs

a. The plant variety shall be novel providing that;

i. it has not been sold or marketed by or with the agreement of the applicant, for more than one year in Pakistan before filing of the application for a certificate

ii. it has not been sold or marketed by or with the agreement of the applicant, for more than six years in the case of trees or vines and for more than four years in the case of all other plants in a foreign country before filing of the application for a certificate

b. Distinct, if it clearly differs by one or more identifiable morphological, physiological or other characteristics from any other variety

c. Uniform, if subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its essential characteristics

d. Stable, if its relevant characteristics remain unchanged after repeated propagation or in the case of a particular cycle of propagation

e. Acceptable denomination

FEE STRUCTURE

Following is the Fee schedule for various activities related to Plant Varietal Protection (PVP)

Sr.#	Matter of fee	Amount of fee (PKR)	Amount of fee (USD)
1	Application Charges	10,000	100
2	Request for change in application	1000	10
3	Application for change in denomination	1000	10
4	Preliminary examination of application	10,000	100
5	DUS evaluation	10,000	500
6	Notice of Opposition	5000	50
7	Extension of Time	1500/month	15/month
8	Fees for Registration of EDV	20,000	200
9	Annual Fee	10,000	100
10	Application for claim of benefit Sharing	5000	50
11	Application for Registering as Agent/Licensee	10000	100
12	Application for making any change in the Register	1000	10
13	Issuance of protection certificate	10,000	100
14	Application for issuance of duplicate certificate	5,000	50
15	Charges for re-issuance of certificate after making corrections	5,000	50

Fee can be submitted on TR-6 form at National Bank of Pakistan.

RELEVANT REGULATIONS

PBRS REGULATIONS (details available on www.pbrr.gov.pk)

- PBR Act, 2016
- PBR Rules, 2018

SEED BUSINESS REGULATIONS

- Seed Act, 1976
- The Seed Amendment Act, 2015
- Seed Registration Rules, 1987
- Amendment (2021) in Seed Registration Rules, 1987
- Seed Business (Regulation) Rules, 2016
- Amendments (2021) in Business Regulations Rules, 2016
- Seed Truth In Labelling Rules, 1991
- Amendment (1993) in Seed Truth in Labelling Rules,1991
- Amendment (1998) in Seed Truth in Labelling Rules, 1991

(details available on http://www.federalseed.gov.pk/ and/or www.pbrr.gov.pk)

REGISTERED AND RELEASED VARIETIES

The list of varieties already registered and released in Pakistan is available on http://www.federalseed.gov.pk/ and/or www.pbrr.gov.pk)

CASES FOR OPPOSITION

1. Application No. PBRR-Banana-40/21

Name of the Applicant: **Director NIGAB, NARC**

Institute: **NIGAB, PARC**

Application for: **New Plant Variety**

Denomination of Variety: **NIGAB 1**

Crop: **Banana (*Musa Sapientum*)**

Type of Variety: **Hybrid**

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

Salient Features:

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 blothes
Blothes color	Brown black
Petiole canal leaf III	Open with margins spreading

Petiole margin	Winged and clasping the pseudostem
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 points 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 forms 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 behavior 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 behavior	Falling after the bract
Compound tepal basic colour	Cream
Compound tepal pigmentation	Rust colored spots
Lobe colour of compound 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 exertion	Exerted
Filament colour	White
Anther color	Cream
Pollen sac color	Cream
Style basic color	White
Pigmentation on style	Without pigmentation
Style exertion	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
Fruit position	Curved upward (obliquely, at a 45º angle upward)
Number of fruits	13-16
Fruit length (cm)	<15 cm
Fruit Shape (longitudinal curvature)	Curved
Transverse section of fruit	Slightly rigid
Fruit apex	Blunt-tipped
Remains of flower relicts at fruit apex	Persistent 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	Persistent
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
Pseudostem height (cm)	269.8
Pseudostem 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: The Variety NIGAB-I has drooping leaf habits with rusty brown pseudostem pigmentation. The underlying color of pseudostem 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 45º.	

Opposition can be filed up-till 08-01-2023

2. Application No.: PBRR-Banana-41/21

Name of the Applicant: **Director NIGAB, NARC**

Institute: **NIGAB, PARC**

Application for: **New Plant Variety**

Denomination of Variety: **NIGAB II**

Crop: **Banana (*Musa Sapientum*)**

Type of Variety: **Hybrid**

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

Salient features:

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
Development 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 pseudostem
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	Medium green
Appearance of leaf lower surface	Dull
Wax on leaves	Very little
Insertion points 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 forms 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 behavior 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 behavior	Falling after the bract
Compound tepal basic colour	Cream
Compound tepal pigmentation	Rust colored spots
Lobe colour of compound 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
Fruit position	Curved upward (obliquely, at a 45º angle upward)
Number of fruits	13-16
Fruit length (cm)	<15 cm
Fruit Shape (longitudinal curvature)	Curved
Transverse section of fruit	Pronounced ridges
Fruit apex	Blunt-tipped
Remains of flower relicts at fruit apex	Persistent style
Fruit pedicel length (mm)	>21 mm
Fruit pedicel width (mm)	>10 mm
Pedicel 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	Persistent
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 variety has looping leaf habits with dull appearance of lower side of leaves hand has very little wax. Its peduncle color is green and bunch hangs vertically. Fruit bunch is truncated cone shape and fingers are arranged on biseriate pattern. Rachis falls vertically with very prominent bracket scars and male bud is like top. Fingers has pronounced ridges and are blunt tipped.	

Opposition can be filed up-till 08-01-2023

3. Application No. PBRR-Canola-56/21

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Rachna Canola**

Crop: **Canola (*Brassica napus*)**

Type of Variety: **OPV**

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

Salient Features:

Area adaptation	Irrigated and Rainfed areas of Punjab
Country/origin	Pakistan
Maturity days	155-165
Maturity duration	Medium
Crop season	Rabi
Sowing time	1st fortnight of October
Seedling characteristics	
Growth habit	Erect
Seedling anthocyanin	Medium to Strong
Plant characteristics	
Plant height cm	190 – 225
Plant type	Determinate
Growth habit	Indeterminate
Plant colour	Dark Green
Leaf characteristics	
Leaf colour	Green
Leaf attitude	Semi Erect
Leaf size	Large
Petiole base	Medium to Broad
Petiole length cm	20 -22
Leaf lobing	Deeply lobed

Leaf margin indent	Medium
Terminal segment	Large
Leaf hairs	Absent
Leaf auricles	Partly present
Leaf anthocyanin	Absent
Leaf attachment	Lower leaf Stalked & Upper leaves Sessile
Stem characteristics	
Stem shape	Roundish
Stem thickness mm	19 – 21
Stem stiffness	Medium
Stem pith	Hollow
Flower characteristics	
Days to flowering	80-90
Earlier than	Commercial Hybrids
Flowering duration	Long
Petal colour	Yellow
Anther dotting	Absent
Pollination	Self
Silique characteristics	
Silique shape	Flat
Silique anthocyanin	Absent
Silique attitude	Horizontal
Beak shape	Conical
Shattering	Medium
Seed characteristics	
Seed colour	Dark Brown
Seed size	Medium
Reticulation	Absent
Glucosinolates	23 m/ oil free meal.

Erucic acid%	1.00 - 1.8
Meal protein%	26 – 30
1000 seed weight	3.00 - 4.00
Average yield	2500
Maximum yield	3273
Oil %	40-42
Resistant to	
Lodging	Tolerant
Black leg	Tolerant
Mildew	Tolerant
Aphids	Tolerant
Distinguish characters: Early maturity & high yielding than check variety Super Canola.	

Opposition can be filed up-till 08-01-2023

4. Application No. PBRR-Canola-43/21

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Sandal Canola**

Crop: **Canola (*Brassica napus*)**

Type of Variety: **OPV**

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

Salient Features:

Area adaptation	Irrigated and Rainfed areas of Punjab
Country/origin	Pakistan
Institute/ organization	Oilseeds Research Institute, Faisalabad
Maturity days	155-165 days
Maturity duration	Medium
Crop season	Rabi
Sowing time	1st fortnight of October
Seedling characteristics	
Growth habit	Erect
Seedling anthocyanin	Medium to Strong
Plant characteristics	
PLANT HEIGHT cm	185 -225
Plant type	Determinate
Growth habit	Indeterminate
Plant colour	Dark Green
Leaf characteristics	
Leaf colour	Green
Leaf attitude	Semi Erect
Leaf size	Large
Petiole base	Medium to Broad

PETIOLE LENGTH cm	20 – 22
Leaf lobing	Dee 1 lobed
Leaf margin indentation	Medium
Terminal segment	Large
Leaf hairs	Absent
Leaf auricles	Partly present
Leaf anthocyanin	Absent
Leaf attachment	Lower leaf stalked; upper leaves Sessile
Stem characteristics	
Stem shape	Roundish
STEM THICKNESS mm	20-22
Stem stiffness	Medium
Stem pith	Hollow
Ramification	Low Level
Flower characteristics	
Days to flowering	68-72 Days
Earlier than	Commercial Hybrids
Flowering duration	Long
Petal colour	Yellow
Anther dotting	Absent
Pollination	Self
Silique characteristics	
Silique shape	Flat
Silique anthocyanin	Absent
Silique attitude	Horizontal
Beak shape	Conical
Shattering	Medium
Seed characteristics	

Seed colour	Black
Seed size	Medium
Reticulation	Absent
Glucosinolates	25 m/ oil free meal.
Erucic acid%	0.2-0.3
Meal protein	24 -26
000 seed weight	5.00 - 5.20
Average yield	2500
Maximum yield	3244
Oil %	40—43
Resistant to	
Lodging	Tolerant
Black leg	Tolerant
Mildew	Tolerant
Aphids	Tolerant
Distinguish characters: Early maturity & long Silique size than check variety Faisal Canola.	

Opposition can be filed up-till 08-01-2023

5. Application No. **PBRR-Canola-42/21**

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Super Canola**

Crop: **Canola (*Brassica napus*)**

Type of Variety: **OPV**

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

Salient features:

Area adaptation	Irrigated and rained areas of Punjab
Country/origin	Pakistan
Institute/ organization	Oilseeds Research Institute, Faisalabad
Maturity days	160-165 da s
Maturity duration	Medium
Crop season	Rabi
Sowing time	1st fortnight of October
Seedling characteristics	
Growth habit	Erect
Seedling anthocyanin	Medium to Strong
Plant characteristics	
Plant height cm	190 - 230
Plant type	Determinate
Growth habit	Indeterminate
Plant colour	Dark Green
Leaf characteristics	
Leaf colour	Dark Green
Leaf attitude	Semi Erect
Leaf size	Large
Petiole base	Medium to Broad
PETIOLE LENGTH cm	18-20
Leaf lobing	Dee I lobed

Leaf margin indent	Medium
Terminal segment	Large
Leaf hairs	Absent
Leaf auricles	Absent partly resent
Leaf anthocyanin	Absent
Leaf attachment	Lower leaf Stalked & Upper leaves sessile
Stem characteristics	
Stem shape	Round
Stem thickness mm	20-25
Stem stiffness	Medium
Stem pith	Hollow
Ramification	Low Level
Flower characteristics	
Days to flowering	70-75 Days
Earlier than	Commercial Hybrids
Flowering duration	Long
Petal colour	Yellow
Anther dotting	Absent
Pollination	Self
Silique shape	Flat
Silique anthocyanin	Absent
Silique attitude	Horizontal
Beak shape	Conical
Shattering	Medium
Seed characteristics	
Seed colour	Black
Seed size	Medium
Reticulation	Absent
Glucosinolates	24 m/ oil free meal.
Erucic acid%	0.2-0.3%
Meal protein	37-38 %

000 seed weight	4.00 - 4.40
Average yield (avg. Of 21 locations	2130
Oil %	41-43 %
Resistant to	
Lodging	Tolerant
Black leg	Resistant
Mildew	Resistant
Aphids	Tolerant
Distinguish characters: Less inter-Silique distance, lodging tolerant and oil quality better than check variety Faisal Canola.	

Opposition can be filed up-till 08-01-2023

6. Application No. PBRR-Maize-08/21

Name of the Applicant: **Data Agro Limited**

Institute: **Data Agro Limited**

Application for: **New Plant Variety**

Denomination of Variety: **DAL 2271**

Crop: **Maize (*Zia mays*)**

Type of Variety: **Hybrid**

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

Salient features:

Days to Maturity	
Maturity duration	Medium
Sowing time	Autumn (mid-June to end-August)
Seedling characteristics	
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
Plant length up to flag leaf	Long (>170 cm)
Stem characteristics	
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
Leaf characteristics	
Leaf angle between blade and stem (on leaf just above upper ear)	Small <45º
Leaf attitude of blade (on leaf just above upper ear)	Straight

Leaf width of blade (leaf of upper ear)	Medium (8-9 cm)
Tassel characteristics	
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
Tassel length (cm)	35-40
Tassel stalk length (cm)	24-26
Exertion above flag leaf (cm)	9-11.5
No. Of lateral branches	9-10
Lateral branches density	Lax
Flower characteristics	
Anther fertility	Normal
Pollen shading	Heavy
Anther color	Purple
Pollen color	Dark Yellow
Glume color	Green
Ear characteristics	
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 arrangement	Straight
Cob color	Pink
Seed characteristics	
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%
Yield/ha. (mt)	9-10
Seed sweetness	Present
Seed waxiness	Absent
Seed opaqueness	Present
Resistance to	Lodging
Distinguishing characteristics: 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 yield 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 tassel size is medium with 8-10 branches.	

It has got green silks and purple anthers. the pollen shading of tassel 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.

Opposition can be filed up-till 08-01-2023

7. Application No. PBRR-Maize-12/21

Name of the Applicant: **Corteva Agriscience Pakistan Limited**

Institute: **Pioneer Hi-Bred Private Limited**

Application for: **New Plant Variety**

Denomination of Variety: **Surkhaab**

Crop: **Maize (*Zea mays*)**

Type of Variety: **Hybrid**

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

Salient features:

Plant Height	Tall (271-275 cm)
Leaf Angle	Semi-Erect
Ear Placement:	Medium
Plant pigmentation:	Dark Green
Pigmentation of Brace roots:	Green
Leaf width:	Broad
Leaf colour and margin:	Green
Tassel aspect:	Semi erect
Tassel: Glume colour:	Green
Tassel: Anther colour :	Purple
Tassel: Days to Anthesis:	63-65 Days
Cob: Silk Colour:	Light Green
Cob: Shank colour:	Green
Cob: Days to 50% silking:	65-67 Days
Ear Shape:	Cylindrical
Ear: Grain/Kernel Colour:	Yellow With cap
Ear: Grain type:	Semi flint
Ear: No. of rows per cob:	18-20
Specific information	High yielding Hybrid, Stable Performance & Tolerance to stalk diseases

Opposition can be filed up-till 08-01-2023

8. **Application No. PBRR-Sunflower-44/21**

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Orisun-516**

Crop: **Sunflower (*Helianthus annuus*)**

Type of Variety: **Hybrid (F1)**

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

Salient features:

Variety type	**Hybrid**
Variety use	**Oil**
MATURITY:	
Maturity Days:	**(120-125 days) Medium to late**
Normal crop sowing season:	**Spring**
Suitable for sowing:	**All sowings**
Uniformity in maturity:	**Extremely uniform**
PLANT/STEM CHARACTERISTICS:	
Color at heading	**Light green**
Growing Point	**Yellow green**
Stem Anthocyanin	**Absent**
Pubescence	**Strong**
Stem pubescence length	**Short**
Stem Stiffness:	**Intermediate**
Mature stem height range	**208-224cm**
Stem diameter	**3.0 to 3.5 cm**
Stem Branching	**Absent**
LEAF CHARACTERISTICS	
Leaves / Plant	**30-35**
Leaf Color	**Green**
Leaf anthocyanin coloration	**Absent**
Leaf Attitude	**Semi erect**

Leaf surface	**Crinkled**
Pubescence	**Medium**
Leaf size	**Extra large**
Petiole length	**26 cm**
Leaf angle	**Large**
Leaf shape	**Cordate**
Leaf apex	**Acute**
Leaf base	**Auriculate**
Leaf Auricles	**Very large**
Leaf Margin	**Dentate**
Margin indentation depth	**Medium**
Margin indentation regularity	**Irregular**
Leaf Margin serration fineness	**Very coarse**
Leaf Venation	**Reticulate**
Leaf venation (angle)	**Right**
Petiole pubescence	**Medium**
Leaf Senescence	**Late**
FLOWER CHARACTERISTICS	
Days to flowering	**50% 80-85 days**
Bud diameter	**14.6 cm**
Bract tightness on bud	**Intermediate**
flowering uniformity	**Extremely uniform**
Ray florets	**Dense**
Ray floret shape	**Narrow ovate/ rounded**
Ray floret length	**6-7 cm `**
Ray floret width	**2-3 cm**
Ray floret color	**Yellow**
Ray floret size	**Medium**
Ray floret petal curling	**Flat petal**
HEAD CHARACTERISTICS	
Bract length on bud	**6.5 cm**

Head/ Plant	**Single**
Head Size / Diameter	**Large**
Head main shape of grain side	**Strongly convex**
Head shape uniformity	**Highly uniform**
Head depth / Receptacle thickness	**Deep**
Pubescence	**Medium**
Involucre length	**Medium**
Involucre width	**Medium**
Involucre anthocyanin	**Absent**
Bract Anthocyanin	**Absent**
Head attitude	**Inclined**
Thresh ability	**Moderate**
Shattering	**Low**
Seed weight/ head	**124gm**
SEED CHARACTERISTERISTICS	
Seed Shape	**Broad ovoid**
Seed size	**Medium**
Seed length	**14 mm**
Seed width	**6.5 mm**
Seed Thickness	**3.48 mm**
Seed color	**Black**
Seed stripes	**Present**
Yield/ha	**3.24-3.76 mt**
Oil content	**41%**
Protein	**20-22%**
Susceptibility to pests	
Insects	**MR**
Disease	**MR**
DISTINCTNESS: More drought resistance, larger head size, higher oil content, long duration and yield at par with international check Hysun-33.	

Opposition can be filed up-till 08-01-2023

9. Application No. **PBRR-Sunflower-45/21**

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Orisun-648**

Crop: **Sunflower (*Helianthus annuus*)**

Type of Variety: **Hybrid (F1)**

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

Salient features:

SEEDLING CHARATERISTICS:	
Seedling length	**8-10 cm After 14 days**
Seedling anthocyanin	**Medium**
Seedling Color	**Green**
PLANT/STEM CHARACTERISTICS:	
Stem color at heading (darkest area)	**Green**
Growing Point	**Green**
Stem Anthocyanin	**Absent**
Pubescence at top 5 cm	**Medium**
Mature Stem height	**150-155 cm**
Stem diameter	**3.17 cm**
Stem Branching	**Absent**
LEAF CHARACTERISTICS	
Leaves / Plant	**20-25**
Leaf Color	**Green**
Leaf Attitude	**Semi erect**
Leaf surface	**Crinkled**
Pubescence	**Medium**
Leaf Length (midrib)	**9-12 cm**
Leaf width	**6-8 cm**
Leaf shape	**Cordate**

Leaf apex	**Acute**
Leaf Margin	**Dentate**
Margin indentation regularity	**Irregular**
Leaf venation (angle)	**Acute**
Petiole pubescence	**Medium**
Leaf Senescence	**Medium**
FLOWER CHARACTERISTICS	
Days to flowering %	**72-75 days**
Ray florets	**Many**
Ray floret shape	**Elongated**
Ray floret length	**5-6 cm**
Ray floret width	**2-3 cm**
Ray floret color	**Yellow**
Ray floret size	**Large**
Pollen color	**Yellow**
HEAD CHARACTERISTICS	
Head/ Plant	**Single**
Head Size / Diameter	**16-22 cm Large**
Head main shape of grain side	**Weakly convex**
Head larger than	**Hysun-33**
head depth / Receptacle	**Flat**
Pubescence	**Medium**
Involucre length	**Medium**
Involucre width	**Medium**
Involucre anthocyanin	**Absent**
Head Bracts	**Few**
Bract Anthocyanin	**Absent**
Bract attitude	**slightly embracing**
Head attitude down	**Inclined**
Thresh ability	**Moderate**
Shattering	**Low**

Seed weight/ head	**28-30 gm**
SEED CHARACTERISTERISTICS	
Seed Shape	**Oblong**
Seed size	**Medium**
Seed length	**13 mm**
Seed width	**6 mm**
Seed Thickness	**6 mm**
Seed main color	**Black**
Seed position of stripes	**Present**
Seed spots or mottling on pericarp	**Absent**
Seed index ()	**55.10 gm**
Yield/ha	**3.3 t**
Oil content	**40.5%**
Protein	**22%**
SUSCEPTIBILITY TO PESTS	
Insects	**MR**
Disease	**MR**
DISTINCTNESS: Short duration sunflower hybrid with better yield, medium height and lodging resistant	

Opposition can be filed up-till 08-01-2023

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

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Orisun-675**

Crop: **Sunflower (*Helianthus annuus*)**

Type of Variety: **Hybrid (F1)**

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

Salient features:

Area of Adaptation	**Punjab**
Breeding Center:	**ORI.FSD**
Institute/Organization:	**ORI, ARRI**
Variety Origin	**Local bred**
Variety Type	**Hybrid**
Variety use:	**Oil**
Maturity:	
Maturity days	**98-100 days for specific season**
Earlier than	**N.K.S-278**
Normal crop sowing season	**Spring**
Suitable for sowing	**All sowings**
Uniformity in maturity	**Extremely uniform**
Photoperiodic response	**Neutral**
Seedling characteristics:	
Seedling length	**95-100 mm after 14 days**
Seedling hairiness	**Medium**
Seedling color	**Green**
Hypocotyl anthocyanin coloration	**Medium**
Anthocyanin coloration on margin of young leaves	**Absent**
Size of cotyledons:	**Medium**
Shape of cotyledons	**Elliptical**

Plant / stem characteristics	
Stem; main color at heading (darkest area):	**Light green**
Growing point	**Yellow green**
Stem anthocyanin	**Absent**
Pubescence at the top 5 cm	**Medium**
Stem pubescence length:	**Short**
Stem stiffness	**Intermediate**
Plant height at full flowering	**[180-195 cm] medium, 160.1-200 cm**
Stem branching (excluding environmental branching	**Absent**
Length of internodes (in central third of stem):	**Medium**
Percent stalk breakage (note stage	**0%**
Percent root lodging (note stage):	**Nil %**
Type of root	**Tap**
Leaf characteristics	
Leaves per plant	**24-28**
Leaf color	**Green**
Leaf; anthocyanin coloration on margin of young leaves	**Absent**
Leaf attitude	**Horizontal**
Leaf surface	**Smooth**
Leaf pubescence	**Absent**
Leaf length (midrib)	**[21 cm] medium**
Leaf width	**Medium**
Leaf size	**Medium**
Leaf; petiole anthocyanin	**Moderate**
Leaf; angle between lower part of petiole and stem	**Large**
Leaf shape	**Cordate**
Leaf; shape of distal part	**Acuminate**
Leaf apex	**Acuminate**
Leaf base shape	**Auriculate**

Leaf auricles	**Medium**
Leaf wings	**Medium**
Leaf margin	**Dentate**
Leaf margin indentation depth	**Shallow**
Leaf margin indentation regularity	**Irregular**
Leaf margin serration (fineness)	**Medium**
Leaf venation	**Reticulate**
Leaf; angle of lowest / lateral veins	**Obtuse**
Leaf; habit of petiole	**Semi-erect**
Leaf; petiole pubescence	**Medium**
Leaf senescence	**Medium**
Leaf blistering	**Absent**
Leaf glossiness	**Absent**
Leaf; shape of cross section	**Weakly concave**
Number of leaves on main stem	**Medium, 21-25**
Flower characteristics	
Days to flowering in 50% plants	**[67-69 days] Medium 55-75**
Earlier than	**N.K.S-278, Hysun-33**
Bud opening before flowering	**Present**
Bract tightness on bud	**Intermediate**
Flowering uniformity	**Extremely uniform**
Ray florets; density / number	**Medium 31-40**
Ray floret shape	**Broad ovate**
Ray floret length	**[50mm]**
Ray floret width:	**[20mm]**
Ray floret color	**Medium yellow**
Ray floret size	**Medium**
Ray floret; petal curling	**Flat petal**
Disc flower color	**Yellow**
Stigma color	**Yellow**

Disc flower; anthocyanin coloration of stigma	**Absent**
Disc flower; production of pollen	**Good**
Pollen color	**Yellow**
Disc Flower; Pappi	**Absent**
Extra Floral Nectarie	**Absent**
Head characteristics	
Bract length on bud:	**1.0cm**
Heads/ plant	**Single**
Head size / diameter	**[16-18cm] medium, 15-20 cm**
Larger than	**N.K.S.278**
Head; main shape of grain side	**Weakly convex**
Head shape uniformity	**Highly uniform**
Pubescence	**Medium**
Involucre anthocyanin	**Absent**
Bract shape	**Clearly rounded**
Bract size	**Medium**
Bract; length of tip	**Medium**
Bract; green color of outside	**Medium**
Bract anthocyanin	**Absent**
Bract; attitude in relation to head	**Slightly embracing**
Bract pubescence	**Sparse**
Bract pubescence length	**Short**
Head attitude	**Half turned down with curved stem**
Head angle	**180^0 -225^0**
Thresh ability	**Easy**
Shattering	**Low**
Seed weight/ head	**45-50gm**
Seed characteristics:	
Seed shape	**Broad ovoid**

Seed size	**Small**
Seed length	**[9 mm]**
Seed width	**[4mm]**
Seed thickness	**[3.44mm]**
Seed main color	**Black**
Seed; secondary color	**Grey**
Seed; position of stripes	**Both**
Seed; stripes on margin	**Strongly expressed**
Seed; stripes between margin	**Strongly expressed**
Seed; primary color of stripes	**Grey**
Seed; spots/mottling on pericarp	**Absent**
Seed; pericarp thickness	**Medium, 0.51-0.70 mm**
Seed; cross section shape	**Flat**
Seed index (000)	**[55-60]**
Yield/ h	**3-3.5mt**
Oil content	**41.98%**
Composition of fatty acids in oil	**Oleic/linolenic**
Susceptibility to abiotic stress	
High temperature	**Medium**
Low temperature	**Medium**
Drought	**Medium**
Excess water / flooding	**Medium**
Salinity	**Medium**
Constant winds	**Medium**
High humidity	**Medium**
Iron deficiency (chlorosis)	**Medium**
Insects & diseases resistance	**MR**
Distinctness: **Short duration sunflower hybrid with good yield, better oil content and resistance to biotic and abiotic stress.**	

Opposition can be filed up-till 08-01-2023

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

Name of the Applicant: **Chief Scientist (ORI)**

Institute: **ORI, AARI**

Application for: **New Plant Variety**

Denomination of Variety: **Orisun-701**

Crop: **Sunflower (*Helianthus annuus*)**

Type of Variety: **Hybrid (F1)**

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

Salient features:

Maturity	
Maturity Days	**Medium to late (120-125 days)**
Normal crop sowing season	**Spring**
Suitable for sowing	**All sowings**
Uniformity in maturity	**Extremely uniform**
Seedling characteristics	
Seedling length	**110 mm After 14 days**
Seedling anthocyanin	**Medium**
Seedling Color	**Green**
Hypocotyl anthocyanin coloration	**Absent**
Size of cotyledons	**Medium**
Shape of cotyledons	**Elliptical**
Plant/stem characteristics	
Stem color at heading (darkest area)	**Light green**
Growing Point	**Green**
Stem Anthocyanin	**Absent**
Pubescence at top	**Medium**
Stem pubescence length	**Short**
Stem Stiffness	**Intermediate**
Mature stem height range	**190-215cm**
Stem diameter	**2.8-3.0 cm**
Stem Branching	**Absent**

Length of internodes	**Medium**
Percent stalk breakage	**1-2 %**
Type of root	**Tap**
Leaf characteristics	
Leaves / Plant	**32-35**
Leaf Color	**Green**
Leaf anthocyanin coloration	**Absent**
Leaf Attitude	**Semi erect**
Leaf surface	**Smooth**
Pubescence	**Medium**
Leaf pubescence length	**Short**
Leaf Length (midrib)	**20-28 cm**
Leaf width	**20-24 cm**
Leaf size	**Large**
Petiole length	**12-15 cm**
Petiole anthocyanin	**Absent**
Leaf angle	**Medium**
Leaf shape	**Cordate**
Leaf apex	**Acuminate**
Leaf base	**Auriculate**
Leaf Auricles	**Large**
Leaf Margin	**Dentate**
Margin indentation depth	**Shallow**
Margin indentation regularity	**Irregular**
Leaf Margin serration fineness	**Coarse**
Leaf Venation	**Reticulate**
Petiole pubescence	**Medium**
Leaf Senescence	**Late**
Leaf shape of cross	**Weakly convex**
Flower characteristics	
Days to flowering %	**75-85 days**

Bud diameter	**3 cm**
Bract tightness on bud	**Intermediate**
Flowering uniformity	**Extremely uniform**
Ray florets	**Dense**
Ray floret shape	**Narrow ovate**
Ray floret length	**5-6 cm**
Ray floret width	**2-3 cm**
Ray floret color	**Yellow**
Ray floret size	**Large**
Ray floret petal curling	**Flat petal**
Head characteristics	
Bract length on bud	**1.5 cm**
Head/ Plant	**Single**
Head Size / Diameter	**16-22 cm Large**
Head main shape of grain side	**Weakly convex**
head shape uniformity	**Highly uniform**
head depth / Receptacle	**Medium**
Pubescence	**Medium**
Involucre length	**Medium**
Involucre width	**Medium**
Involucre anthocyanin	**Absent**
Bract Anthocyanin	**Absent**
Bract attitude	**Slightly embracing**
Head attitude down	**Half turned**
Thresh ability	**Moderate**
Shattering	**Low**
Seed weight/ head	**45-55 gm**
Seed characteristics	
Seed Shape	**Broad ovoid**
Seed size	**Medium**
Seed length	**14 mm**

Seed width	**5-7 mm**
Seed Thickness	**3-4 mm**
Seed main color	**Black**
Seed position of stripes	**Marginal & lateral**
Seed spots or mottling on pericarp	**Absent**
Seed index ()	**55-60 gm**
Yield/ha	**2.34-3.23 t**
Oil content	**41%**
Protein	**20-22%**
Susceptibility to abiotic stress	
high temperature	**Medium**
low temperature	**Medium**
Drought	**Medium**
Excess water / Flooding	**Medium**
Salinity	**Medium**
Constant winds	**Medium**
High Humidity	**Medium**
iron deficiency	**Medium**
Susceptibility to pests	
Insects	MR
Disease	MR
Distinctness: More drought resistance, larger head size, higher oil content, long duration and yield at par with international check Hybrids	

Opposition can be filed up-till 08-01-2023

12. Application No. PBRR-Wheat-30/21

Name of the Applicant: **Arid Zone Research Institute, Bhakkar**

Institute: **Arid Zone Research Institute, Bhakkar**

Application for: **New Plant Variety**

Denomination of Variety: **Bhakkar star**

Crop: **Wheat (*Triticum aestivum*)**

Type of Variety: **OPV**

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

Salient features:

Area of adaptation	**Southern Punjab**
Planting Time	**November**
Maturity duration	**Medium**
Earlier than	**Pakistan-2013**
Later than	**Johar-2016**
Suitable for sowing	**Early**
Seedling Characteristics	
Seedling Growth habit	**Semi erect**
Coleoptile Color	**Colorless**
Seedling Anthocyanin	**Absent**
Plant Characteristics	
Plant height (cm)	**105-110**
Taller than	**Gold-2016**
Shorter Than	**Jouhar-2016**
Color at booting	**Pale green**
Stem Characteristics	
Stem Anthocyanin (at flowering)	**Absent**
Stem waxy bloom	**Weak**
Stem Wall thickness	**Intermediate**
Stem stiffness	**Intermediate**
Stem diameter (mm)	**4**
Peduncle length (cm)	**30-35**

Productive Tiller / m	**150-155**
Nodes / stem	**4-5**
Straw color	**Yellowish white**
Lodging	**Absent**
Flag Leaf Characteristics	
Flag leaf attitude	**Erect**
Flag leaf twist	**Medium**
Flag leaf length (cm)	**22-26**
Flag leaf width (cm)	**1.6-1.9**
Flag Sheath wax	**Weak**
Sheath hairiness	**Sparse**
Auricle hairiness	**Absent**
Ear Characteristics	
Ear emergence	**100-105**
Ear size	**Medium**
Ear length (cm)	**12-nov**
Ear width (cm)	**1.2-1.4**
Wax at anthesis	**Weak**
Color at Maturity	**Yellowish white**
Ear shape	**Tapering**
Ear Density	**Dense**
Super numerary spikelets	**Absent**
Speltoids	**Absent**
Shattering	**Resistant**
Flex / kink / twist	**Weak**
Ear awnedness	**Awned**
Awn distribution	**Whole**
Awn length	**Medium**
Awn color	**Yellowish white**
Awn habit	**Erect**
Anther color	**Yellow**

Rachis hair apical	**Medium**
Rachis hair margin	**Medium**
Rachis length (cm)	**11**
Rachis width (mm)	**4**
Number of segments	**13-14**
Glume Characteristics	
Glume length (mm)	**11-oct**
Glume width (mm)	**5-apr**
Glume length size	**Medium**
Glume width size	**Medium**
Lower glume shape	**Broad flat**
Glume attachment	**Strong**
Glume pubescence	**Absent**
Glume surface	**Rough**
Lower glume. shoulder shape	**Round**
Lower glume shoulder width	**Medium**
Beak length (mm)	**3-4**
Lower glume beak shape	**Curved & humped**
Lower glume beak size	**Medium**
Beak spicule	**Present**
Keel spicules	**Absent**
Glume internal hair	**Absent**
Glume Internal impression	**Medium**
Seed Characteristics	
Seed color	**Amber**
Seed Surface	**Opaque**
Seed Shape	**Oval**
Seed Length (mm)	**7-8**
Seed Width (mm)	**4-5**
Seed Thickness (mm)	**4-5**
Seed size	**Bold**

Seed Brush	**Short**
Seed Germ Size	**Medium**
1000 grain weight	**53-55g**
Seed Groove	**Intermediate**
Seeds/ear	**60-70**
Seed hardness	**Medium**
Protein %	**15**
Chapati Quality	**Good**
Bread Quality	**Good**
Phenol Reaction	**None**
Grain Yield (Kg/acre)	**1600-2000**
DISTINGUSHING CHARATERISTICS: 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 UJALLA-2016.	

Flowering Response to seasons	Variable
Drought tolerance	Medium
Tolerance to salinity	Medium
Tolerance to acid soils	Medium
Cold tolerance	Medium
Heat tolerance	Medium

Resistance to insects/pests: Fairly tolerant to termite attack in water stress condition and similarly tolerant to aphid attack as compared to other check varieties.

Resistance to diseases: Resistant to major wheat diseases including stripe, brown and stem rusts as per disease track record of CDRI Islamabad for two years.

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