



Wheat Varieties Ready for Commercialization

HD 3386

It is a bread wheat variety released for timely sown irrigation conditions of NWPZ. Its average yield is 62.5 q/ha. It possesses resistance to yellow and brown rust and moderate resistance against leaf blight, powdery mildew, Karnal bunt and flag smut.

Average Yield (q/ha)	62.5
Plant Height	101 cm
Sowing Time	Timely sown irrigated (1 November - 15 November)
Maturity Time (Days)	144 days
Recommended Area	Punjab, Haryana, Delhi, Rajasthan (Except Kota and Udaipur division), Western UP (Except Jhansi division), Part of J & K (Kathua District), HP (Una district & Paonta Valley) & Uttarakhand (Tarai region)



HD 3385

Registered under PPV&FRA for timely sown irrigated conditions. Resistant to stripe and leaf rusts, and Karnal Bunt.

- It is a heat-tolerant, high-yielding wheat variety resistant to all three rusts (yellow, brown, black) and Karnal Bunt.
- It is suitable for early, timely, and late sowing conditions and has strong lodging tolerance due to its moderate plant height.

Average Yield (q/ha)	62.62 q/ha under NWPZ and CZ, 52.3 under NEPZ
Plant Height	98 cm
Sowing Time	Suitable for all sowing
Maturity Time (Days)	Early sowing (150 days) & Timely Sowing (141 days) under NWPZ; 135-140 days under CZ
Recommended Area	NWPZ (Except Kota and Udaipur Divisions), (Except Jhansi Division), Jammu and Kathua district of J&K, Una district and Paonta Valley of H.P and Uttarakhand (Tarai region), NEPZ (East of UP, Bihar, Jharkhand, West Bengal (excluding hills), Orissa, Assam and plains of N. E. States), CZ (Madhya Pradesh, Chhattisgarh, Gujarat, Rajasthan (excluding Kota and Udaipur), and parts of Maharashtra)



HD 3390

HD 3390 is a biofortified, high-yielding wheat variety with excellent grain appearance, high hectoliter weight (78.2 kg/hl), and good chapati quality. It has strong heat tolerance (HSI: 0.89) and is resistant to all three rusts (yellow, brown, black rusts) and Karnal Bunt.

- Special Features: Superior grain appearance, high grain weight, biofortified with high protein.

Average Yield (q/ha)	62.36
Plant Height	102 cm
Sowing Time	1 November - 15 November
Maturity Time (Days)	140
Recommended Area	Delhi-NCR (timely sown irrigated conditions)



HD 3388 (PUSA YASHODHARA)

HD 3388 is a biofortified wheat variety with high protein content (11.47%), excellent chapati-making quality, and high heat tolerance (HSI: 0.89). It is resistant to major wheat diseases, making it a promising choice for farmers.

- Excellent chapati quality (score 8.0) and resistant to all three rusts (yellow, brown, black rusts) and Karnal Bunt.

Average Yield (q/ha)	52
Plant Height	100 cm
Sowing Time	1 November - 15 November
Maturity Time (Days)	124
Recommended Area	NEPZ (East of UP, Bihar, Jharkhand, West Bengal (excluding hills), Orissa, Assam and plains of N. E. States)



HD 3410

HD 3410 is a biofortified, high-protein wheat variety recommended for early sowing in Madhya Pradesh and Delhi-NCR. It performs well under conventional tillage and conservation agriculture (CA), producing high yields with good grain quality.

- Resistant to all three rusts (yellow, brown, black rusts) and Karnal Bunt.
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| Average Yield (q/ha) | 65.91 |
| Plant Height | 103 cm |
| Sowing Time | Irrigated early sown (25 October - 5 November) conventional tillage and conservation agriculture (CA) environments |
| Maturity Time (Days) | 135-140 (MP), 150 (Delhi NCR) |
| Recommended Area | Delhi state and NCR; Madhya Pradesh |



PUSA OJASWI HI 1650

Released for Central Zone – Timely sown and Restricted Irrigated conditions.

- Average yield 57.2 q/ha
- Potential yield 73.8 q/ha
- Maturity 1115-120 days
- Plant height 89 cm
- 1000 grain weight 47 g (Approx)
- Recommended Area MP, Chattisgarh, Gujrat, Kota, Udaipur division of Rajasthan & Jhansi division of UP.



HW 1098 DICOCCUM (NILGIRI KHAPLI)

It is a high-yielding, semi-dwarf, climate-resilient dicoccum wheat that recorded the highest zonal mean grain yield of 45.53 q/ha with a potential yield of 47.8 q/ha, and shows stable performance under both normal and late sowing due to its inbuilt rust resistance, wide adaptability, and superior grain quality. With high protein content (16.8%) and β -carotene (3.39 ppm), HW 1098 is ideally suited for health-focused and value-added food markets, offering benefits across the entire value chain.

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| Average Yield (q/ha) | 40.47 q/ha (normal sowing), 32.73 q/ha (late sowing) |
| Maturity: | 100-115 days (mean ~106 days) |
| Disease resistance: | Inbuilt resistance to major rusts |
| Adaptability: | Performs reliably under diverse and changing agro-climatic conditions |
| Recommended Area: | Suitable for dicoccum-cultivating regions of Gujarat, Maharashtra, Karnataka and Tamil Nadu. |



HD 3406(UNNAT HD2967)

Bread wheat variety HD 3406 (Unnat HD2967) is Timely sown, Irrigated conditions of North Western Plain Zone.

- Resistant to leaf and stripe rusts, good levels of resistance to wheat blast and Karnal bunt.
 - High Yielding Rust Resistant Variety with Excellent End Product Quality.
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|----------------------|--|
| Average Yield (q/ha) | 54.73 |
| Plant Height | 104 cm |
| Sowing Time | Timely sown irrigated (1 November - 15 November) |
| Maturity Time (Days) | 146 |
| Recommended Area | Punjab, Haryana, Delhi, Rajasthan, Western UP, J&K |





Paddy Varieties Ready for Commercialization



Pusa Basmati 1979

Pusa Basmati 1979 is one of the first Non-GM herbicide tolerant Basmati rice variety released for cultivation in India. It is a MAS derived herbicide tolerant near-isogenic line of Basmati rice variety "PB 1121" possessing mutated *AHAS* allele governing Imazethapyr tolerance

Average Yield (q/ha)	45.8
Plant Height	110-120 cm
Nursery days	21 days after sowing
Sowing Time	June 15 to June 20, before the rain starts
Maturity Time (Days)	130-133 Days
Harvest time	Fourth week of October
Recommended Area	Delhi, Punjab and Haryana

Pusa Basmati 1985

Pusa Basmati 1985 is one of the first non-GM herbicide tolerant Basmati rice variety released for cultivation in India. It is a MAS derived herbicide tolerant near-isogenic line of Basmati rice variety "PB 1509" possessing mutated *AHAS* allele governing Imazethapyr tolerance

Average Yield (q/ha)	52
Plant Height	85-110 cm
Nursery days	21 days after sowing
Sowing Time	Between June 15 and June 20, before the rain starts.
Maturity Time (Days)	110-115
Harvest time	Second week of October
Recommended Area	Delhi, Punjab and Western Uttar Pradesh



PUSA BASMATI 1847

Pusa Basmati 1847 is a MAS derived near isogenic line (NIL) of a popular short-duration Basmati rice variety, Pusa Basmati 1509.

- Resistance to both bacterial blight and blast diseases.
- Avoids the use of antibiotics and fungicides in the management of two major diseases, bacterial blight and blast, respectively.
- possessing two genes for bacterial blight resistance xa13 and Xa21; and two genes for blast resistance, Pi54 and Pi2

Average Yield (q/ha)	57
Plant Height	108 cm
Nursery days	21 days after sowing
Sowing Time	First to second week of June
Maturity Time (Days)	125-128
Harvest time	Second week of October
Recommended Area	Delhi, Punjab and Western Uttar Pradesh



PUSA BASMATI 1885

Pusa Basmati 1885 is a MAS derived near isogenic line (NIL) of a popular short-duration Basmati rice variety, Pusa Basmati 1121.

- Resistance to both bacterial blight and blast diseases.
- Avoids the use of antibiotics and fungicides in the management of two major diseases, bacterial blight and blast, respectively.

Average Yield (q/ha)	46.8
Plant Height	120 cm
Nursery days	21 days after sowing
Sowing Time	First to second week of June
Maturity Time (Days)	135-140
Harvest time	First week of November
Recommended Area	Delhi, Punjab and Haryana



PUSA BASMATI 1886

Pusa Basmati 1886 is a MAS derived near isogenic line (NIL) of a popular short-duration Basmati rice variety, Pusa Basmati 6.

- Resistance to both bacterial blight and blast diseases.
- Avoids the use of antibiotics and fungicides in the management of two major diseases, bacterial blight and blast, respectively.

Average Yield (q/ha)	50-55
Plant Height	90-100 cm
Nursery days	21 days after sowing
Sowing Time	First to second week of June
Maturity Time (Days)	140-145
Harvest time	First week of November
Recommended Area	Haryana and Uttarakhand



PUSA BASMATI 1509

First early maturing Basmati rice variety with seed to seed maturity of only 115-120 days.

moderate resistance to leaf blast and brown spot diseases

- its semi-dwarf stature, non-lodging and non-shattering habit, reduced duration, yield on par
- very good kernel length after cooking (18.2 mm) , desirable ASV (7.0)

Average Yield (q/ha)	42.5
Plant Height	94-101 cm
Nursery days	21 days after sowing
Sowing Time	Second week of June
Maturity Time (Days)	115-120
Harvest time	Second week of October
Recommended Area	Western Uttar Pradesh, Punjab and Delhi



PUSA BASMATI 1692

Pusa Basmati 1692 is a semi-dwarf Basmati variety with a seed-to-seed maturity of 110-115 days. Timely clearing of fields will also help in reducing the environmental pollution and help in timely sowing of the succeeding wheat crop in the Basmati GI area.

Average Yield (q/ha)	52.6
Plant Height	101 cm
Nursery days	21 days after sowing
Sowing Time	Second week of June
Maturity Time (Days)	110-115
Harvest time	Second Week of October
Recommended Area	Delhi, Haryana and western Uttar Pradesh



PUSA BASMATI 1718

PB 1718 is a near isogenic line of Pusa Basmati 1121 with bacterial blight resistance governed by *xa13* and *Xa21* which were transferred through molecular marker assisted breeding.

Average Yield (q/ha)	45-50
Plant Height	120 cm
Nursery days	21 days after sowing
Sowing Time	First to second week of June
Maturity Time (Days)	130-135
Harvest time	First week of November
Recommended Area	Punjab, Haryana & Delhi



Pusa 1824

Early maturing with a seed-to-seed maturity of 120-122 days. It has semi-dwarf, non-lodging and non-shattering habit with very sturdy stem. Owing to its early maturity, it can help timely harvest of paddy crop in the Delhi-NCT area, which can help providing sufficient time for after-harvest operations.

Average Yield (q/ha)	95
Plant Height	90-93 cm
Nursery days	21 days after sowing
Sowing Time	First to second week of June
Maturity Time (Days)	120-122
Harvest time	Second week of October
Recommended Area	Delhi NCT area

Pusa 2090

Early maturing with a seed-to-seed maturity of 127 days. It has semi-dwarf, non-lodging and non-shattering habit with very sturdy stem. Owing to its early maturity, it can help timely harvest of paddy crop in the Delhi-NCT area, which can help providing sufficient time for after-harvest operations. NCT area.

Average Yield (q/ha)	88.4
Plant Height	104
Nursery days	21 days after sowing
Sowing Time	First to second week of June
Maturity Time (Days)	129-129
Harvest time	Second week of October
Recommended Area	Delhi NCT area





Maize Varieties Ready for Commercialization

PUSA SUPER SWEET CORN-1

A high-sugar sweet corn hybrid with the recessive *shrunken2* (*sh2*) gene, delivering enhanced sweetness up to 15.9° Brix and excellent eating quality. Ideal for fresh consumption, processing, and food industries, it performs well across multiple agro-climatic regions under irrigated conditions.

Average Yield (q/ha): 98.4 (NHZ), 97.0 (NWPZ), 75.3 (NEPZ), 101.6 (PZ)
Sowing Time: Kharif season
Maturity Time (Days): 81 days (NHZ), 74 days (NWPZ), 78 days (NEPZ) and 77 days (PZ)
Recommended Area: NHZ, NWPZ, NEPZ & PZ



PUSA SUPER SWEET CORN-2

Pusa Super Sweet Corn-2 (*sh2sh2*) is a high-yielding sweet corn hybrid developed by IARI, carrying the *sh2* gene for extra sweetness. It has a high Brix value of 16.4%, reflecting its superior sugar content and quality.

Average Yield (q/ha): 95.0 q/ha
Sowing Time: kharif Season
Maturity Time (Days): 77 days
Recommended Area: Himachal Pradesh, Haryana, Uttarakhand, Uttar Pradesh, Tamil Nadu, Karnataka, Rajasthan & Chhattisgarh



PUSA HM4 MALE STERILE BABY CORN (SHISHU)

India's first male-sterile baby corn hybrid, bred for early maturity and premium light cream-colored ears (8.7–9.2 cm length, 1.2–1.3 cm girth).

A dual-purpose variety delivering high baby corn quality and rich green fodder yield (271 q/ha) for human food and animal feed.

Average Yield: 22.7 q/ha (dehusked baby ears)
Sowing Time: Kharif season
Maturity Time (Days): 51 days
Recommended Area: NWPZ



PUSA BIOFORTIFIED MAIZE HYBRID-1

This hybrid is developed for nutritional security, with high levels of provitamin-A (6.60 ppm), lysine (3.37%), and tryptophan (0.72%). It is highly adaptable and offers good performance under irrigated conditions.

Average Yield (q/ha): 76.2 (NHZ), 54.4 (NEPZ)
Sowing Time: Kharif season
Maturity Time (Days): 107 days (NHZ) and 86 days (NEPZ)
Recommended Area: NHZ & NEPZ



PUSA BIOFORTIFIED MAIZE HYBRID-2



A nutritionally superior hybrid with high provitamin-A (5.90 ppm), lysine (3.47%), and tryptophan (0.92%). It is well-suited for nutritional security and has excellent yield potential in different agro-climatic zones.

Average Yield (q/ha): 75.4 (NWPZ), 53.7 (NEPZ), 51.1 (CWZ)
Sowing Time: Kharif season
Maturity Time (Days): 91 days (NWPZ), 88 days (NEPZ) & 89 days (CWZ)
Recommended Area: NWPZ, NEPZ & CWZ

PUSA BIOFORTIFIED MAIZE HYBRID-3

A MAS-derived hybrid with high nutritional value (provitamin-A 5.70 ppm, lysine 3.52%, tryptophan 0.87%). It is recommended for cultivation in multiple agro-climatic zones.

Average Yield (q/ha): 82.2 (NWPZ), 71.6 (PZ), 58.5 (CWZ)
Sowing Time: Kharif
Maturity Time (Days): 92 days (NWPZ), 84 days (PZ) & 87 days (CWZ)
Recommended Area: NWPZ, PZ & CWZ



PUSA BIOFORTIFIED MAIZE HYBRID-4



A MAS-derived hybrid with high nutritional value (provitamin-A 6.70 ppm, lysine 3.47%, tryptophan 0.78%). It is recommended for cultivation in multiple agro-climatic zones.

Average Yield (q/ha): 84.3 (NWPZ), 71.1 (PZ), 56.5 (CWZ)
Sowing Time: Kharif
Maturity Time (Days): 80 days (NWPZ), 94 days (PZ) & 86 days (CWZ)
Recommended Area: NWPZ, PZ & CWZ

PUSA BIOFORTIFIED MAIZE HYBRID-5

Rich in α -tocopherol/ vitamin-E (21.60 ppm), provitamin-A (6.22 ppm), lysine (4.91% in flour) and tryptophan (1.01% in flour)

Average Yield (q/ha): 80.83 q/ha (NWPZ), 51.58 q/ha (NEPZ), 76.61 q/ha (PZ) & 72.31 q/ha (CWZ)
Sowing Time: Kharif
Maturity Time (Days): 94 days (NWPZ), 91 days (NEPZ), 96 days (PZ) & 89 days (CWZ)
Recommended Area: NWPZ, NEPZ, PZ and CWZ



PUSA BIOFORTIFIED MAIZE HYBRID-6



Rich in α -tocopherol/ vitamin-E (21.38 ppm), provitamin-A (6.03 ppm), lysine (0.358% in flour) and tryptophan (0.079% in flour)

Average Yield (q/ha): 74.27 q/ha (NWPZ), and 50.078 q/ha (NEPZ), & 69.94 q/ha (CWZ)
Sowing Time: Kharif
Maturity Time (Days): 95 days (Average)
Recommended Area: NWPZ, NEPZ and CWZ

PUSA BIOFORTIFIED MAIZE HYBRID-7

Low phytic acid (2.21 mg/g), lysine (0.327% in flour) and tryptophan (0.080% in flour)

Average Yield (q/ha): 72.57 q/ha (NWPZ), and 65.18 q/ha (CWZ)
Sowing Time: Kharif
Maturity Time (Days): 90-92 days
Recommended Area: NWPZ and CWZ



PUSA BIOFORTIFIED MAIZE HYBRID-8

Low phytic acid (2.17 mg/g), lysine (0.347% in flour) and tryptophan (0.074% in flour)

Average Yield (q/ha): 49.69 q/ha (NEPZ)
Sowing Time: Kharif
Maturity Time (Days): 90-95 days
Recommended Area: NEPZ



PUSA HQPM1 IMPROVED

Pusa HQPM-1 Improved is a high-quality protein maize hybrid developed through the introgression of crtR1 and lcyE genes. It is rich in provitamin-A (7.02 ppm), lysine (4.59%), and tryptophan (0.85%), making it nutritionally superior to conventional maize. Average Yield (q/ha): 81.9 q/ha (NHZ), 69.7 q/ha (NWPZ), 59.5 q/ha (NEPZ), 79.3 q/ha (PZ), 50.9 q/ha (CWZ)

Sowing Time: Kharif, Rabi and Spring seasons
Maturity Time (Days): 111 days (NHZ), 94 days (NWPZ), 90 days (NEPZ), 96 days (PZ), 92 days (CWZ)
Recommended Area: NHZ, NWPZ, NEPZ, PZ and CWZ



PUSA HQPM4 IMPROVED

A nutritionally superior QPM hybrid with high grain yield, enriched with provitamin-A (6.04 ppm) and improved protein quality through higher lysine and tryptophan. It delivers stable, consistent performance across major maize-growing regions, supporting food, feed, and nutritional security programs.

Average Yield (q/ha): 78.50 q/ha (NWPZ) and 77.26 q/ha (CWZ)
Sowing Time: Kharif
Maturity Time (Days): 88-92 days
Recommended Area: NWPZ & CWZ



PUSA HQPM5 IMPROVED

Pusa HQPM5 Improved is a biofortified maize hybrid with high provitamin-A (6.77 ppm), lysine (4.25%), and tryptophan (0.94%) content. It is developed for improved nutritional quality and better yield potential.

Average Yield (q/ha): 72.6 q/ha (NHZ), 75.1 q/ha (NWPZ), 53.5 q/ha (NEPZ), 71.2 q/ha (PZ), 51.2 q/ha (CWZ),
Sowing Time: Kharif, Rabi and Spring seasons
Maturity Time (Days): 111 days (NHZ), 92 days (NWPZ), 88 days (NEPZ), 98 days (PZ), 91 days (CWZ)
Recommended Area: NHZ, NWPZ, NEPZ, PZ and CWZ



PUSA HQPM7 IMPROVED

A nutritionally superior HQPM hybrid with enhanced grain yield, enriched provitamin-A (7.10 µg/g) and improved protein quality due to higher tryptophan and lysine. Well suited for food, feed and nutritional security programmes in peninsular India.

Average Yield (q/ha): 7450 kg/ha (PZ)
Sowing Time: Kharif
Maturity Time (Days): 97 days
Recommended Area: Peninsular Zone (Maharashtra, Karnataka, Andhra Pradesh, Telangana & Tamil Nadu)



PUSA POPCORN HYBRID 1

A specialty popcorn maize hybrid with excellent popping quality, featuring 98.3% popping and a high expansion ratio of 18. Ideal for commercial popcorn processing.

Average Yield (q/ha): 46.0 q/ha (NWPZ) and 47.2 q/ha (PZ)
Sowing Time: Rabi season
Maturity Time (Days): 120 days (NWPZ), and 102 days (PZ)
Recommended Area: NWPZ, and PZ



PUSA POPCORN HYBRID-2

A specialty popcorn maize hybrid with excellent popping quality, featuring 96.7% popping and a high expansion ratio of 19. Ideal for commercial popcorn processing.

Average Yield (q/ha): 45.13 q/ha (PZ)
Sowing Time: Rabi season
Maturity Time (Days): 103 days (PZ)
Recommended Area: PZ



PUSA WAXY MAIZE HYBRID-1

A specialty waxy maize hybrid with very high amylopectin content (93.9%), ideal for starch-based industries and food processing. It also offers improved protein quality and stable grain yield under north-western plain conditions.

Average Yield (q/ha): 72.69 q/ha (NWPZ)
Sowing Time: Kharif season
Maturity Time (Days): 89 days
Recommended Area: NWPZ



PUSA FORAGE MAIZE HYBRID-1

A high-yielding forage maize hybrid delivering very high green fodder yield (413.1 q/ha) with superior quality. It offers excellent biomass, high ADF (41.9%), NDF (62.5%) and good IVDMD (56.4%), ideal for dairy and livestock systems.

Fodder Yield: 413.1 q/ha (NWZ)
Sowing Time: Kharif season
Maturity Time (Days): 68 days
Recommended Area: North West Zone (NWZ) – Tarai region of Uttarakhand, Punjab, Haryana & Rajasthan



PUSA JAWAHAR HYBRID MAIZE-3

The AH-8181 was identified and released as PusaJawahar Hybrid Maize-3 (PJHM-3) for rabi conditions of Madhya Pradesh State. PJHM-3 has stay green nature and hence has very good fodder value Kernel has oil content of 4.7%, and protein content 9.8%. It has field tolerance to stem borer and fall army worm.

Average Yield (q/ha): 82.0 q/ha
Maturity Time (Days): 125 days (medium maturity under rabi)
Disease resistance: Resistant to FusariumStalk Rot, moderately resistant to TurcicumLeaf Blight and Maydis Leaf Blight
Adaptability: Rabi condition, tolerant to drought
Recommended Area: Madhya Pradesh state.



PUSA SHALIMAR MAIZE HYBRID-1

The AH-7154 was identified and released as Pusa Shalimar Maize Hybrid-1 for Jammu and Kashmir state. It is a early maturing field con hybrid suitable for hill ecology. The kernels are bright orange bold and plants stays green after physiological maturity.

Average Yield (q/ha): 88 q/ha
Maturity Time (Days): 125 days (Early in Hills)
Disease resistance: Resistant to curvularialeaf spot and Rajasthan downeymildew, moderate resistant reaction to Turcicum Leaf Blight and Maydis Leaf Blight
Adaptability: Suitable for hill ecology
Recommended Area: Jammu and Kashmir state



PUSA EARLY HYBRID MAIZE-6

The AH-8323 was identified and released as Pusa Early Hybrid Maize-6 for kharif conditions. It is a high yielding, early maturing single cross field corn hybrid. The kernel colour is orange and flint in texture.

Average Yield (q/ha): 81.80 q/ha (Irrigated kharif condition).
Maturity Time (Days): 85 days
Disease resistance: The hybrid recorded resistant to moderate resistant reaction to Turcicum Leaf Blight and Maydis Leaf Blight
Adaptability: Kharif condition
Recommended Area: CWZ covering Rajasthan, Madhya Pradesh, Chhattisgarh, and Gujarat





Mustard Varieties Ready for Commercialization

PUSA MUSTARD 27

It is a short duration, early-maturing brown seeded mustard variety developed by ICAR-IARI. This variety is tolerant to high temperature stress at germination stage making it suitable for early sowing conditions in diverse agro-climatic conditions.

Average Yield (q/ha)	15.35
Plant Height	195 cm
Sowing Time	Second fortnight of September
Maturity Time (Days)	118
Harvest time	Second fortnight of January
Recommended Area	Zone-III, Uttar Pradesh, Uttarakhand, Madhya Pradesh & Kota region of Rajasthan



PUSA MUSTARD 28

It is a short duration, early-maturing brown seeded mustard variety developed by ICAR-IARI. This variety is tolerant to high temperature stress at germination stage making it suitable for early sowing conditions in diverse agro-climatic conditions.

Average Yield (q/ha)	19.93
Plant Height	185 cm
Sowing Time	Second fortnight of September
Maturity Time (Days)	107
Harvest time	Second fortnight of January
Recommended Area	Zone-II: Punjab, Haryana, Delhi, Jammu and Rajasthan



PUSA MUSTARD 29

It is a brown-seeded, single zero mustard variety developed by ICAR-IARI. The erucic acid content in the oil of this variety is less than 2%. With superior oil quality, PM 30 is a reliable choice for mustard growing farmers aiming for enhanced yield and profitability.

Average Yield (q/ha)	21.7
Plant Height	232 cm
Sowing Time	Second fortnight of October
Maturity Time (Days)	143
Harvest time	Second fortnight of March
Recommended Area	Zone-II: Punjab, Haryana, Delhi, Jammu & Northern Rajasthan



PUSA MUSTARD 30

It is a brown and bold-seeded, single zero mustard variety developed by ICAR-IARI. The erucic acid content in the oil of this variety is less than 2%. With superior oil quality PM 30 is a reliable choice for mustard growing farmers aiming for enhanced yield and profitability.

Average Yield (q/ha)	18.24
Plant Height	200 cm
Sowing Time	Second fortnight of Oct
Maturity Time (Days)	137
Harvest time	Second fortnight of March
Recommended Area	Zone-III; Uttar Pradesh, Uttarakhand, Madhya Pradesh & Eastern Rajasthan



PUSA DOUBLE ZERO MUSTARD 31



It is a canola-quality mustard variety developed by ICAR-IARI. It is yellow-seeded variety with <2% erucic acid in oil along with < 30 ppm glucosinolate in seed meal, making it suitable for health-conscious consumers and cattle feed industries. This variety has 40.6% oil content ensuring productivity and profitability for farmers.

Average Yield (q/ha)	23.24
Plant Height	196 cm
Sowing Time	Second fortnight of Oct
Maturity Time (Days)	144
Harvest time	Second fortnight of March
Recommended Area	Zone-II: Punjab, Haryana, Delhi, Jammu and Northern Rajasthan

PUSA MUSTARD 32

It is a high yielding, brown seeded, single zero mustard variety developed by ICAR-IARI. The erucic acid content in the oil of this variety is less than 2%. With premium oil quality, PM 32 is a dependable option for mustard farmers seeking higher yields and increased profitability.

Average Yield (q/ha)	27.13
Plant Height	205 cm
Sowing Time	Second fortnight of Oct
Maturity Time (Days)	145
Harvest time	Second fortnight of March
Recommended Area	Zone-II; Rajasthan (Northern and Western Parts), Punjab, Haryana, Delhi, Western Uttar Pradesh, plains of Jammu and Kashmir and Himachal Pradesh



PUSA DOUBLE ZERO MUSTARD 33



It is a high yielding canola-quality mustard variety developed by ICAR-IARI. It is yellow seeded variety with <2% erucic acid in oil along with < 30 ppm glucosinolate in seed meal, making it suitable for health-conscious consumers and cattle feed industries.

Average Yield (q/ha)	26.44
Plant Height	205 cm
Sowing Time	Second fortnight of Oct
Maturity Time (Days)	141
Harvest time	Second fortnight of March
Recommended Area	Zone-II, Jammu, Punjab, Haryana, Delhi, & Northern Rajasthan.

PUSA MUSTARD 37 (NPJ 253)

It is a high-yielding Indian mustard variety with stable performance, wide adaptability, bold seeds, and good oil content. It is tolerant to major biotic stresses and suitable for timely sowing under both irrigated and rainfed conditions, offering strong commercial potential.

Yield:	26.4 q/ha (Zone-II) & 26.8 q/ha (Zone-III)
Oil Content:	40%
Maturity Time (Days):	145 in zone-II & 134 in zone-III
Recommended Area:	Zone -II & III: Jammu, Punjab., Haryana, Delhi, Rajasthan, Uttarakhand, Uttar Pradesh, Mathya Pradesh and Bihar



CHICKPEA VARIETIES

PUSA MANAV (BGM 20211)

It is a MABC derived wilt resistance introgression line of chickpea variety "Pusa 391" possessing introgression of "QTL region" for wilt resistance on LG 2 having QTLs 1,3,4 & 5 from WR 315. It is the highest yielding chickpea variety released ever in the country till date.

- Average yield (q/ha) 24 q/ha with potential of 39 q/ha
- Sowing time Timely sown conditions
- Maturity 108-110 days
- Resistance/tolerance It is highly resistant to Fusarium wilt, moderately resistant to dry root rot, collar rot and stunt and moderately resistant to pod borer.
- Recommended area CVRC for Central Zone comprising Chhattisgarh, Bundelkhand region of UP, MP, South Rajasthan, Maharashtra and Gujarat.

PUSA CHICKPEA 10216

It is a drought tolerant variety. It was developed through MABC, introgressing "QTL-hotspot" from ICC 4958.

- Average yield (q/ha) 16 q/ha with potential of 25 q/ha under drought stress conditions
- Sowing time Suitable for timely/ late sown conditions and both for normal and restricted irrigation
- Maturity 110 days
- Resistance/tolerance highly drought tolerant, resistant to Fusarium wilt & stunt. Moderately resistant to dry root rot, collar rot and pod borer.
- Recommended area Central Zone of Chhattisgarh, Madhya Pradesh, Bundelkhand region of UP, South Rajasthan, Maharashtra & Gujarat

PUSA CHICKPEA 4035 (BG 4035)

It is a an Extra Large Seeded Kabuli Variety (Double dollar type). Have an excellent grain color, size and shape. Its average 100-seed weight is 65 g and above. It's grain protein content is 24 per cent. Due to its bold size and tolerance to wilt, it not only fits in Central Zone but has a very high demand for export and domestic market fetching farmers premium price.

- Average yield (q/ha) 16 q/ha with potential of 25 q/ha
- Sowing time Timely sown conditions
- Maturity 110-115 days
- Resistance/tolerance It is highly resistant to Fusarium wilt. It is moderately resistant to dry root rot.
- Recommended area PPVFRA protected variety and recommended for cultivation for Central Zone comprising MP, South Rajasthan, Maharashtra and Gujarat.



Lentils Varieties Ready for Commercialization

LENTIL VARIETIES

L 4717

L 4717 is a biofortified variety with medium-sized grains (2.5 g per 100 seeds), enriched with 65 ppm iron and 49.8 ppm zinc, tolerant to wilt and rust, and containing 25.6% protein.

- Area of adaptation CZ (MP, Parts of UP, RJ and Chhattisgarh) and Bihar State
- Production condition Irrigated and rainfed
- Season Rabi
- Average grain yield 14-15 qtl/ha
- Potential grain yield 25 qtl/ha
- Maturity 102 days

L 4727

L 4727 is an early-maturing variety with medium-sized grains (3.2 g per 100 seeds), containing 26.5% protein and showing moderate resistance to wilt and rust.

- Area of adaptation CZ (MP, Parts of UP, RJ and Chhattisgarh)
- Production condition Irrigated and rainfed
- Season Rabi
- Average grain yield 11.5 qtl/ha
- Potential grain yield 24 qtl/ha
- Maturity 103 days

L 4729

L 4729 is an early maturing variety with medium-sized grains (2.8 g/100 seeds), showing moderate resistance to wilt and rust, and containing 24.9% protein along with 78.0 ppm iron and 52.0 ppm zinc.

- Area of adaptation CZ (MP, Parts of UP, RJ and Chhattisgarh)
- Production condition Irrigated and rainfed
- Season Rabi
- Average grain yield 17.5 qtl/ha
- Potential grain yield 25 qtl/ha
- Maturity 103 days

PDL-1

The variety is nutritionally rich (Fe 93.0 mg/kg, Zn 52.5 mg/kg, 24.5% protein) and resistant to major diseases and pests, with added tolerance to salt, drought, and lodging.

- Area of adaptation Haryana and UP
- Production condition Saline field condition (ECe 5.1 to 6.0 dS/m)
- Season Rabi
- Average grain yield 20 qtl/ha, 9.49q/ha [moderate salt affected condition]
- Potential grain yield 24 qtl/ha
- Maturity 140 days



PSL 9

The variety is characterized by a 100-seed weight of 2.8 g, high nutritional quality with 62.0 mg/kg iron, 36.5 mg/kg zinc, and 24.5% protein content, along with resistance to major diseases and insect pests and a special feature of salt tolerance.

- Area of adaptation Haryana and UP
- Production condition Saline field condition (ECe 5.1 to 6.0 dS/m).
- Season Rabi
- Average grain yield 9.49q/ha [moderate salt affected condition]
- Potential grain yield 20 qtl/ha
- Maturity 112 days



PSL 19

It is resistant to wilt and ascochyta blight, with a 100-seed weight of 2.3 g.

- Area of adaptation NCR
- Production condition Saline field condition (ECe 5.1 to 5.8 dS/m).
- Season Rabi
- Average grain yield 15 qtl/ha
- Potential grain yield 18 qtl/ha
- Maturity 124 days



OATS VARIETIES

GRAIN OATS VARIETY - JWGO-01

The variety is characterized by a 100-seed weight of 2.8 g, high nutritional quality with 62.0 mg/kg iron, 36.5 mg/kg zinc, and 24.5% protein content, along with resistance to major diseases and insect pests and a special feature of salt tolerance.

- Average grain yield 33.73 q/ha across zones
- 1000-Grain Weight 42.5 g.
- Maturity 106-111 days (average 109 days).
- Recommended Area Suitable for MP, Maharashtra, and northern and central plains; adaptable to marginal and low-fertility soils under restricted irrigation.



MUNGBEAN VARIETIES

PUSA 1641

It is a high-performing variety resistant to MYMV, Cercospora leaf spots (CLS), anthracnose, web blight, and urdbean leaf crinkle diseases, with a 100-seed weight of 4.5 g and enriched nutritional quality containing 23.8% protein, 62.1 ppm iron, and 12.6 ppm zinc.

- Area of adaptation NCR
- Production condition Irrigated
- Season Spring summer
- Average grain yield 13.1 qtl/ha
- Potential grain yield 14 qtl/ha
- Maturity 63days



PUSA 1431

It is a disease-resistant variety with 4.0 g seed weight and rich nutritional value (24.4% protein, 66.7 ppm iron, 12.9 ppm zinc).

- Area of adaptation NCR
- Production condition Irrigated
- Season Spring
- Average grain yield 12.9 qtl/ha
- Potential grain yield 13.8 qtl/ha
- Maturity 66 days



PIGEON PEA VARIETIES

PUSA ARHAR 16

Extra early (120 days), semi-dwarf and sterility mosaic resistant variety. Suitable for easy spraying and mechanized harvesting. Allows timely sowing of succeeding crops, increasing cropping intensity.

- Potential yield (q/ha) 1.19.76 q/ha
- Plant height 120-125 cm
- Sowing time 1st week of June and can be done upto 2nd week of July. Irrigated
- Maturity 120 days
- Resistance/tolerance Resistant to sterility mosaic disease and Fusarium wilt.
- Recommended area Delhi & NCT



PUSA ARHAR 2017-1

Early maturing (120-125 days), indeterminate and compact semi-erect type, suitable for dense planting and sole cropping.

- Potential yield (q/ha) 21.16 q/ha
- Plant height 135 to 141 cm
- Sowing time 1st week of June & Irrigated
- Maturity 120-125 days
- Resistance/tolerance Disease incidence not experienced at IARI, New Delhi. However, early maturity enables it to reduce losses due to diseases.
- Recommended area Delhi & NCT



PUSA ARHAR 2018-4

It is suitable for sole cropping. Bold seeded with mean 100 seed weight of 8.7 g.

- Potential yield (q/ha) 23.06 q/ha
- Plant height 167.4 cm (Ranged from 152 to 175 cm)
- Sowing time 1st week of June & Irrigated
- Maturity 140-145 days
- Resistance/tolerance Disease incidence not experienced at IARI, New Delhi. However, early maturity enables it to reduce losses due to diseases
- Recommended area NWPZ (Punjab, Delhi, Haryana and Western UP)



DPAC-47: MULTIPISTILLATE GYNOECIOU PARTHENOCARPIC INBRED

A multipistillate gynoecious parthenocarpic inbred suitable for protected cultivation. This inbred can be used as a variety or as a parent in developing F1 hybrids suitable for protected cultivation. It can bear 2-4 female buds per node and set 2-3 fruits on most nodes.

- Suitability as a parent developing F1 hybrid
- Fruit Dark green, 15-18.0 cm long
- Weight 117 g
- Season Year-round under protected conditions
- Yield 127.2 t/ha



DC-44: STABLE RESISTANCE TO DOWNY MILDEW

Highly resistant to downy mildew disease which causes severe yield loss in cucumber. It can be used as a donor in developing elite cucumber inbreds with resistance to downy mildew disease

- Suitability Can be used as donor for Downy mildew resistance
- Fruit Light green, black spine, 13.5-16.0 cm long
Spring Summer and Kharif season under
- Season North Indian conditions
- Yield 22.5 t/ha



GYNOECIOUS CUCUMBER HYBRID-18

An early-maturing hybrid produces attractive green fruits with mild whitish-green stripes from the blossom end and brownish-green blotchy patches near the stem end. The fruits are 18-20 cm long, with soft skin, crispy, tender flesh, and an average weight of 200-210 g.

- Area of adaptation Zone I-Jammu & Kashmir, Himachal Pradesh and Uttarakhand
- Breeding method Heterosis breeding
- Season Spring-summer and Kharif
- Yield 24 t/ha
- Potential yield 30 t/ha
- Days to first harvest 40-45 days from sowing



Cucumber Varieties Ready for Commercialization

GYNOECIOUS INBRED DC-48

The gynoecy-controlling F locus was introgressed through marker-assisted backcrossing, ensuring stable gynoecious expression. The genotype has white spines, green-coloured fruits after harvest, delayed senescence, and improved post-harvest quality, making it an ideal female parent and donor for gynoecism in cucumber breeding.

- Suitability As female parent in development of F1 hybrid
- Fruit Light green with extended shelf-life, 15-17 cm long
- Season Suitable for both Spring-summer and Kharif seasons



GYNOECIOUS INBRED DC-303

The gynoecy-controlling F locus was introgressed through marker-assisted backcrossing, ensuring stable gynoecious expression. The genotype has white spines, green-coloured fruits after harvest, delayed senescence, and improved post-harvest quality, making it an ideal female parent and donor for gynoecism in cucumber breeding.

- Suitability As female parent in development of F1 hybrid
- Fruit Light green with extended shelf-life, 14-16 cm long
- Season Suitable for both Spring-summer season



DC-61: HIGHLY RESISTANCE TO TOLCNDV

Highly resistant to leaf curl disease, predominantly caused by ToLCNDV. It can be used as a donor in developing elite cucumber inbreds with resistance to leaf curl diseases predominantly caused by ToLCNDV.

- Suitability Can be used as donor for ToLCNDV resistance
- Fruit Light green, black spine, 12-14 cm long
- Season Kharif season under North Indian conditions
- Yield 22.3 t/ha



PUSA GYNOECIOUS CUCUMBER HYBRID-1301

It exhibits high yield potential and is well suited for open-field cultivation during the Spring-Summer and Kharif seasons. The hybrid is early to medium in maturity, with first harvesting possible at 40-45 days after planting. The fruits are light green in colour with black spines.

- Fruit Length: 15-17 cm.
- Season Spring Summer and Kharif
- Weight 213.5 g.
- Yield 26.4 t ha⁻¹



PUSA PARTHENOCARPCIC CUCUMBER HYBRID-1

It is ideal for protected cultivation in polyhouse and insect-proof net house conditions. It is early maturing, with first harvest in 40-45 days, and produces uniform, dark green, glossy, cylindrical fruits with tender skin, crisp flesh, and excellent market appeal.

- Under protected conditions for Parthecarpic inbreds and hybrids
- Suitability Protected cultivation under net house and polyhouse
- Fruit length: 18.32 cm; width: 3.14 cm, and the mean individual fruit.
- Weight 115.0 g
- Season Year round
- Yield 143.6 t ha⁻¹



DPAC-43: MULTIPISTILLATE GYNOECIOUS PARTHENOCARPCIC INBRED

A multipistillate gynoecious parthenocarpic inbred suitable for protected cultivation. This inbred can be used as a variety or as a parent in developing F1 hybrids suitable for protected cultivation. It can bear 2-4 female buds in each node and can set 2-3 fruits in the majority of the nodes.

- Under protected conditions for Parthecarpic inbreds and hybrids
 - Suitability as a parent developing F1 hybrid
 - Fruit Dark green, 14.5-16.0 cm long
 - Weight 118.5 g
 - Season Year round under protected conditions
 - Yield 125.5 t/ha



PUSA PARTHENOCARPCIC CUCUMBER HYBRID-2

It is for protected cultivation shows high productivity under polyhouse and insect-proof net house conditions. It bears 3-4 pistillate buds per node, sets up to two fruits per node, and is early maturing (35-40 days). Fruits are dark green, glossy, cylindrical, tender, and market-attractive with smooth, stripe-free skin.

- Under protected conditions for Parthecarpic inbreds and hybrids
- Suitability Protected cultivation under net house and polyhouse
- Fruit Length: 16.65 cm; Width: 3.11 cm; Mean individual fruit
- Weight 108.5 g
- Season Year round
- Yield 150.5 t ha⁻¹



DPAC-41: MULTIPISTILLATE GYNOECIOUS PARTHENOCARPCIC INBRED

A multipistillate gynoecious parthenocarpic inbred suitable for protected cultivation. This inbred can be used as a variety or as a parent in developing F1 hybrids suitable for protected cultivation. It can bear 2-3 female buds per node and set 2-3 fruits on most nodes.

- Under protected conditions for Parthecarpic inbreds and hybrids
 - Suitability as a parent developing F1 hybrid
 - Fruit Dark green, 13.5-15.0 cm long
 - Weight 113 g
 - Season Year-round under protected conditions
 - Yield 121.4 t/ha





Vegetable Varieties Ready for Commercialization

BRINJAL CV PUSA VAIBHAV

The plant has medium-sized leaves with light purple mid-rib & veins and medium-sized purple flowers. The round, shiny purple fruits with a non-spiny green calyx and pistil scar. Borne solitarily and average fruit weight 250 g. Suitable for Bharta making & resistant to fusarium wilt, virus complex and little leaf under Delhi field condition

Area of adaptation	Punjab, UP, Bihar, Jharkhand
Breeding method	Hybridization followed by selection
Season	Kharif
Yield	41 t/ha
Potential yield	58 t/ha
Days to first harvest	55-60 days from transplanting



BRINJAL CV PUSA KRISHNA

The tall plants have non-spiny, erect branches and medium-sized leaves with sinuate margins and light purple pigmentation on the mid-rib and veins. The medium-sized purple flowers, shiny, oval-round fruits borne solitarily, average fruit weight 200 g. Suitable for Bharta making & resistant to Fusarium wilt, virus complex and little leaf under field condition

Area of adaptation	Zone VII (Madhya Pradesh, Maharashtra)
Breeding method	Hybridization followed by selection
Season	Kharif
Yield	39 t/ha
Potential yield	49 t/ha
Days to first harvest	55-60 days from transplanting



ONION CV PUSA RIDDHI

The compact, flat-globe bulbs, dark red, with an equatorial diameter of 4.5–6.0 cm and a polar diameter of 4.8–6.3 cm. Weighing 70–100 g, pungent, rich in antioxidants (quercetin 105 mg/100g), and suitable for storage and export.

Area of adaptation	NCT Delhi
Breeding method	Selfing and massing
Season	Rabi
Yield	31 t/ha
Potential yield	35 t/ha
Days to first harvest	130-140 days after transplanting



ONION CV PUSA SHOBHA

The compact, flat-globe brown bulbs, with an equatorial diameter of 4.5–6.0 cm and a polar diameter of 4.5–6.5 cm, weigh 70–100 g. High TSS (17 ± 2°Brix) and suitable for storage, drying, processing, & export.

Area of adaptation	Delhi, U.P., Haryana, Bihar and Punjab, Rajasthan and Gujarat, M.P., Chattishgarh and Odisha
Breeding method	Selfing and massing
Season	Rabi
Yield	25 t/ha
Potential yield	30 t/ha
Days to first harvest	140-160 days after transplanting



MUSKMELON CV PUSA MADHURIMA

Plants have weakly lobed leaves with andromonoecious sex expression and bear ovate to obovate fruits (700–800 g). Fruits have a creamish–yellow rind with green sutures, moderately netted surface, green juicy flesh (3.4 cm thick), medium musky flavor, high sweetness (12°Brix), and become slipable at maturity.

Area of adaptation	NCT Delhi
Breeding method	Individual plant selection
Season	Spring summer
Yield	22 t/ha
Potential yield	25 t/ha
Days to first harvest	80 days after sowing

MUSKMELON CV PUSA HYBRID 2

It is an early maturing hybrid, fruits are flat-round with thick, green, juicy, and crispy flesh, a medium musky flavor, and high sweetness (TSS 12° Brix). It shows field tolerance to Fusarium wilt.

Area of adaptation	Maharashtra & Madhya Pradesh
Season	Spring summer
Average fruit weight	800 gram
Potential yield	221.7 q/ha
Days to first harvest	71 days after sowing

MUSKMELON C.V. PUSA KESERI (HYBRID)

Orange fleshed hybrid of speciality melon (inodorous group) with higher shelf life, thick, crunchy flesh with high sweetness and no musky flavour.

Area of adaptation	NCT
Season	summer and autumn (net house/polyhouse)
Average fruit weight	1100 gram
Potential yield	577q/ha in net house/polyhouse
Days to first harvest	81 days after sowing

TOMATO CV PUSA SHAKTI

It is an indeterminate, high-yielding, produces round, deep red fruit (avg. wt. 75g) with a thick pericarp (7.0 mm), 4.8° Brix TSS, and 6.0 mg/100g lycopene content. The variety is ready for harvest in 70–75 days.

Area of adaptation	Zone V (Chhattisgarh, Odisha, Andhra Pradesh and Telangana)
Breeding method	Pedigree Method
Season	Suitable for cultivation from October to May
Average yield	351.6 q/ha under open field condition
Days to first harvest	70–75 days after transplanting

PUSA RED CHERRY TOMATO-3

A cherry tomato variety suitable for open field (Oct–May) and protected cultivation (Sept–April). It produces round, deep red fruits (13.6 g) with thick pericarp, high sweetness (10.1 °Brix), rich lycopene, and is ideal for fresh salads and premium niche markets.

Average fruit yield	358 q/ha under open filed and 6q/100 sq. m. in protected condition.
Sowing time	September–October
Maturity period	April –May
Area of adaptation	Zone-I (Uttarakhand, Himachal Pradesh, Jammu & Kashmir and Ladak)



PUSA GOLDEN CHERRY TOMATO-2

- The average fruit weight is about 7-8 g with approximately average fruit yield 3.5-4.0 kg/plant.
- Characterized by indeterminate growth habit and attains average vine length varying from 8-12 m.
- Released in 2022 for Delhi-NCT Region
- Suitable for protected cultivation
- First harvesting at 75-80 days after transplanting
- Potential yield: 090-100 q /1000 m²
- TSS: 9 brix

PUSA PROTECTED TOMATO-1

- Released in 2022 for Delhi-NCT Region
- Suitable for protected cultivation
- First harvesting at 75-85 days after transplanting
- Averageyield: 140 q/ 1000 sqm
- TSS: 5.6 brix



PUSA COCKTAIL TOMATO



- Released in 2024 for Delhi-NCT Region
- Suitable for protected cultivation and open cultivation
- First harvesting at 75-80 days after transplanting
- Averageyield: 110 q/ 1000 sqm
- TSS: 9 brix

TOMATO PUSA PRASANSKRIT

- Released in 2024 for Delhi-NCT Region
- Processing type tomato variety having Ty3 gene for ToLCD resistance suitable
- Suitable for protected cultivation and open cultivation
- Averageyield: 800 q/ ha
- TSS: 5.1 brix



CARROT CV PUSA PRATEEK



Root obtriangular & red in colour, self-cored, juicy, sweet, with an average length of 20-22 cm and a weight of 100-120 g. Rich in total carotenoids (6000 µg/100g), lycopene (1550 µg/100g), and TSS of 9.25°Brix.

Area of adaptation	Zone VI (Rajasthan, Gujarat, Haryana, Delhi), Zone VIII (Karnataka, Tamil Nadu, Kerala, Puducherry)
Breeding method	Selfing and massing
Season	Rabi (Winter season)
Yield	30 t/ha
Potential yield	33 t/ha
Days to first harvest	85-90 days after seed sowing

BITTER GOURD: DBGS-16-2



It is an open pollinated predominantly gynoecious line with higher female: male (1:1) sex ratio, broken ridges, bright and shiny fruits, highly preferred by the consumers. Fruits are long (15-16cm) dark green and discontinuous ridges.

Area of adaptation	Throughout the country during summer season
Breeding method	Single plant selection
Season	Summer season
Yield	25 tons/ha
Potential yield	22-25 tonnes/ ha
Days to first harvest	55 days

BITTER GOURD: DBGS-23

Fruits are small to medium (8.0-10.0cm), dark green, and spiny surface, predominantly gynoecious sex with higher female: male (2:1) flowers. Yield potential is 21.5 tons/ha.

Area of adaptation	Throughout the country during summer season
Breeding method	Single plant selection
Season	Summer season
Yield	22 tons/ha
Potential yield	25 tons/ha
Days to first harvest	52 days



BITTER GOURD: PUSA PROTECTED BITTER GOURD-2



It has higher female: male flower ratio (1:1). Fruits are attractive green, uniform, glossy, cylindrical, straight those are suitable for processing purpose. Best suitable for machan/trelling system of cultivation during summer season.

Area of adaptation	Throughout the country during summer season
Breeding method	Single plant selection
Season	Summer season
Yield	24 tons/ha
Potential yield	26 tons/ha
Days to first harvest	54 days

BITTER GOURD: PUSA SANJEEVANI

It is predominantly gynoecious with higher female: male (1:1) sex ratio. Fruits are long (18-22cm) dark green, and continuous ridges. Also known as Jhalri segment. It has a yield potential of 25.0 tons/ha. It is also resistant to leaf curl virus and require minimum pesticides.

Area of adaptation	Throughout the country during summer season
Breeding method	Single plant selection
Season	Kharif and summer season
Yield	25 tons/ha
Potential yield	28 tons/ha
Days to first harvest	55 days



METHI CV PEB



An early-maturing variety known for its quick growth, uniform bunching, and high yield. It has dark green, tender leaves and is well-suited for multiple harvests, making it ideal for commercial cultivation and kitchen gardens.

Area of adaptation	Well-suited for diverse agro-climatic regions, primarily grown in North and Central India.
Breeding method	Self
Season	Suitable for sowing in September to November
Yield	heavy yielder, 5-6 cuttings at 15-20 days interval
Days to first harvest	Around 30-40 days after sowing

Farm Machinery Ready for Commercialization



ROBOTIC SEED SPICE HARVESTER



Technology Brief:

A self-propelled precision harvester designed for seed spice crops such as cumin, coriander, fennel, and other small-seeded spices. It ensures efficient harvesting with minimal shattering losses under both dryland and irrigated conditions. The machine features a 0.65 m working width, 0.08 ha/h field capacity, 71% field efficiency, and operates at a forward speed of 0.5–2.0 km/h.

Salient Features:

- Self-propelled platform with automated navigation
- Precision cutting mechanism for delicate seed spices
- Adjustable cutting height and operating speed
- Low vibration harvesting system
- Compact design suitable for narrow row spacing

Benefits/Utility:

- Minimizes seed shattering and grain losses
- Improves harvesting efficiency
- Reduces labour requirement
- Suitable for small and fragmented holdings
- Ensures better produce quality retention

CUMIN HARVESTER



Technology Brief:

A specialized cumin harvester designed for efficient harvesting at maturity under dryland and irrigated conditions, minimizing shattering losses through a dedicated cutting and conveying system.

Salient Features:

- Specialized cutting mechanism for delicate plants
- Adjustable cutting height with integrated collection system
- Suitable for low-height, closely spaced crops
- Working width: 0.55 m; Field capacity: 0.06 ha/h
- Field efficiency: 62%; Forward speed: 0.5–3.0 km/h

Benefits/Utility:

- Reduced seed shattering and grain losses compared to manual harvesting
- Labour-saving and time-efficient operation
- Cost-effective with improved output quality
- Enhances overall harvesting efficiency

ROOT WASHED TYPE PADDY TRANSPLANTING ROBOT



Technology Brief:

A mechanized transplanter designed for root-washed (non-mat) rice seedlings in puddled lowland fields, ensuring precise and uniform planting in irrigated paddy systems.

Salient Features:

- Remote-operated 2-row transplanting mechanism
- Adjustable row (20–30 cm) and hill spacing (15–20 cm) with 3–5 cm depth
- Uniform spacing with high planting accuracy (98% efficiency)
- Field capacity: 0.2–0.4 ha/day; Speed: 1.0–1.5 km/h
- Suitable for small and fragmented fields

Benefits/Utility:

- Reduces labour and drudgery in manual transplanting
- Minimizes seedling damage and improves crop establishment
- Ensures high field survival rate under proper puddled conditions

SOLAR-POWERED VARIABLE SWATH HERBICIDE APPLICATOR ROBOT FOR AGRICULTURAL APPLICATION



Technology Brief:

A solar-powered, remote-operated robotic sprayer designed for precision weed management in row crops and vegetable fields. It enables targeted herbicide application for pre- and post-emergence weed control under precision and conservation agriculture systems.

Salient Features:

- Solar-powered robotic platform with AI-based sensor weed detection
- Variable swath width (1.3–2.8 m) based on weed density and crop spacing
- Targeted spot spraying with 150–200 micron droplet size
- Tank capacity: 60 L
- Field capacity: 0.4 ha/h; Speed: 0.46–1.54 km/h
- Spraying efficiency: 85–90%

Benefits/Utility:

- 20–25% reduction in chemical usage
- Zero tailpipe emissions and low operating cost
- Labour-saving and suitable for small, fragmented fields
- Lightweight design reduces soil compaction

ELECTRONIC SAFETY ALARM AND BRAKE DEVICE FOR CHAFF CUTTER



Technology Brief:

A safety enhancement system for power-operated chaff cutters designed to prevent accidents during chaff cutting by providing early warning and automatic stoppage in case of accidental hand entry or abnormal feeding. Suitable for farm-level fodder units and dairy enterprises.

Salient Features:

- Sensor-based hand detection (5–15 cm) with instant alarm and auto brake (≤ 1 sec)
- Retrofittable, low-voltage system with battery backup (up to 1 week)
- Solar charging (4–6 hours), no impact on cutting capacity

Benefits/Utility:

- Prevents severe injuries and accidents
- Improves operator safety
- Low-cost, easy to use and maintain

FIELD PERFORMANCE MEASURING APPARATUS FOR FARM IMPLEMENTS



Technology Brief:

An electronic field performance monitoring system designed to measure and record operational parameters of agricultural implements under actual field conditions. It supports testing, calibration, and optimization of tillage, seeding, planting, and other tractor-operated machinery.

Salient Features:

- Sensors for draft, speed, and field capacity measurement
- Real-time digital display with data logging
- Measures distance, area, depth, time, and efficiency
- Accurate and adaptable to various tractor–implement setups

Benefits/Utility:

- Supports testing, calibration, and optimization
- Useful for research, custom hiring, and standardization

REMOTE CONTROLLED PESTICIDE APPLICATOR SUITABLE FOR GREENHOUSE AND OPEN FIELD



Technology Brief:

A remote-controlled pesticide sprayer designed for safe and efficient application in greenhouses and open fields, ensuring uniform coverage while minimizing operator exposure to harmful chemicals in vegetable, horticultural, and field crops.

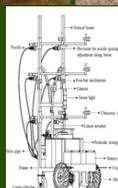
Salient Features:

- Remote-controlled with adjustable boom and nozzle system
- Fine droplet spray (100–150 micron); suitable for greenhouse and open fields
- Coverage: 1.5–2.5 m (vertical), 1.5–2.0 m (horizontal)
- 50 L tank; 0.15 ha/h field capacity; 1.0–1.5 km/h speed

Benefits/Utility:

- Reduces operator exposure
- Ensures uniform spray with less chemical wastage
- Labour-saving and easy to operate

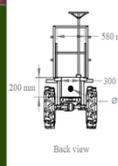
ROBOTIC PESTICIDE APPLICATOR FOR GREENHOUSE



This telerobotic system is designed for targeted pesticide application in greenhouses, reducing chemical exposure for operators and optimizing pesticide use. It is remotely operated and equipped with sensors to detect plant canopies, ensuring efficient and precise spraying while improving operator safety.

- Remote-controlled operation prevents direct chemical exposure.
- Uses ultrasonic sensors for plant detection and targeted spraying.
- Powered by a pair of 24V 42Ah DC batteries, ensuring reliable performance.
- Environmental sensors assess weather conditions for optimal operation.
- Reduces pesticide wastage by 24%, making it cost-effective.

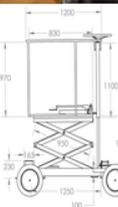
ELECTRIC MULTI-TOOL CARRIER FOR GREENHOUSE



This battery-powered machine is designed for multiple greenhouse operations, including bed formation, spraying, pollination, and haulage. It improves efficiency and reduces labor dependency by automating essential tasks.

- Versatile equipment for multiple greenhouse functions.
- Can carry up to 400 kg while maintaining a speed of 20 km/h.
- Battery-operated for environmentally friendly operation.
- Has a minimum turning radius of 3.5m and ground clearance of 40cm.
- Reduces labor costs and increases productivity.
- Costs ₹2,12,000, with an operational cost of ₹206 per hour.

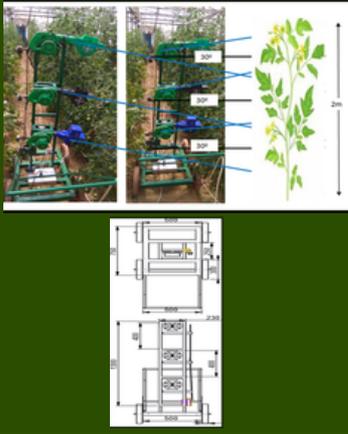
VARIABLE HEIGHT PLATFORM



This platform helps in greenhouse operations by allowing workers to adjust their working height easily. It significantly reduces labor requirements and enhances safety by providing a stable and adjustable work surface.

- Reduces labor effort by up to 60% in greenhouse operations.
- Covers a 2000 m² area with a single unit.
- Hydraulic pump with manual and power pack operation.
- Double-scissor lifting mechanism for adjustable height.
- Maximum lifting capacity of 120 kg, with a turning radius of 200 cm.
- Battery-powered, self-propelled, and equipped with a telescopic steering system.

ELECTRIC POLLINATOR FOR GREENHOUSE



Designed to improve pollination efficiency in greenhouse conditions, this device uses a pulsating air jet to facilitate effective pollination. It enhances fruit setting and increases tomato yield, overcoming the challenge of limited natural pollinators in greenhouses.

- Uses pulsating air jets for effective pollination.
- Achieves a pollination efficiency of 83.66%.
- Optimized with airflow at 1.99 m³/min and pulsation frequency of 23.50 Hz.
- Increases tomato yield to 19.52 kg per 5-meter plant row.
- Ensures consistent fruit setting and productivity in controlled environments.
- Reduces dependence on natural pollinators, making greenhouse cultivation more reliable.

SENSOR-BASED SAFETY DEVICE FOR CHAFF CUTTER



This safety device prevents accidents caused by chaff cutters, which are widely used for cutting fodder. It integrates multiple sensors to detect human presence and instantly stops the machine, preventing serious injuries. It can be mounted on conventional chaff cutters and even runs on solar power for energy efficiency.

- Uses PIR and LDR sensors to detect human presence near the feed rollers.
- Automatically stops the machine within seconds to prevent accidents.
- Generates visual and audio alerts to warn operators.
- Equipped with temperature and humidity sensors for better detection.
- Solar-powered option ensures continuous and eco-friendly operation.
- Can be retrofitted to existing chaff cutters for enhanced safety.

AQUA FERTI SEED DRILL



Utility: It makes possible the application of aqueous fertilizer alongside the seed which helps in better germination and initial development of crop. Machine is suitable for sowing Rabi crops like wheat gram and others.

Capacity: It is able to apply 8000-10000 litres of aqueous fertilizer per hectare in a controlled manner as per the need and recommendation. Field capacity of the machine is 0.25 ha / h

Savings: A 53% increase in germination and 35% increase in yield in wheat crop have been observed in comparison to control. Suitable for pulses also. Timely sowing of Rabi crops like wheat, gram, mustard etc in rain fed areas.

PUSA COMPOST TURNER CUM MIXER



Utility: Pusa Compost turner cum mixer facilitates thorough mixing of crop biomass including rice residues for quality compost production by windrow method. The machine causes turning and mixing of material in bulk with simultaneous application of inoculum. This leads to improved aeration of compost material creating favourable conditions for microbial growth and material degradation. The turner-cum-mixer reduces the energy consumption per tonne of the material handled and is used for mass production of quality compost using windrow/pile method of composting.

Capacity: 1000 tonnes per hour

Savings:

- Pusa Compost turner cum mixer facilitates quality compost production in bulk.
- Compost preparation by manual method is labour-intensive. Also, handling cowdung manually is full of drudgery. The use of machines overcomes the labour problem and hastens the compost preparation process while imparting dignity to labour.
- The technology facilitates compost making in 60-80 days as compared to 6 month period required in traditional pit method.

POWER INTEGRAL EQUIPMENT:



Utility: Powered Integral Equipment is a tri-wheel riding type equipment (mini-tractor) for small farm mechanization. The Powered Integral Equipment is in single chassis with better stability and steerability, less turning radius and with hydraulic depth control system for tillage equipment. The Powered Integral Equipment is operated with an 8 hp diesel engine with power transmission system designed for both rotary and pull type equipment. It can perform multiple operations like shallow ploughing, interculture, weeding, sowing, rototilling, and irrigation water pumping with a single power source.

Capacity: 0.04–0.2 ha/h.

Savings: A solution for small farm mechanization. The technology facilitates ownership of machinery in small land holding farmers for whom ownership of large machines and single function equipment is not economically feasible.

MULTI-CROP PLANTER FOR VEGETABLE SEEDS



Utility: This is a manual seeding machine operated by single person. Planting of small and bold vegetable seeds with adjustable seed spacing. Seed spacings are changed by replacing the vertical rollers and changing the sprocket positions.

Capacity: This is a manual seeding machine operated by single person. The field capacity of the planter is 0.03 ha.h⁻¹.

Savings: Precision planting of vegetable seeds in small plots, 15% saving in seed with 85–90% singulation.

PUSA MANUAL PADDY THRESHER



Utility: It makes possible the application of aqueous fertilizer alongside the seed which helps in better germination and initial development of crop. Machine is suitable for sowing Rabi crops like wheat gram and others.

Capacity: It is able to apply 8000–10000 litres of aqueous fertilizer per hectare in a controlled manner as per the need and recommendation. Field capacity of the machine is 0.25 ha / h

Savings: A 53% increase in germination and 35% increase in yield in wheat crop have been observed in comparison to control. Suitable for pulses also. Timely sowing of Rabi crops like wheat, gram, mustard etc in rain fed areas.

PRE-GERMINATED PADDY SEEDER



Utility: Pre-germinated paddy seeder facilitates sowing of pre-germinated paddy seed in puddled field maintaining proper row to row spacing.

Capacity: Pusa Pre-germinated Paddy Seeder is available in two forms - three and six rows with per day field capacity of 0.2 ha and 0.4 ha, respectively.

Savings: It reduces the cost of transplanting and also helps in subsequent operation of weeding and inter-cultivation.

PUSA I-THERM PROCESSOR



Purpose and field application: Post Harvest Processing & Value Addition – Drying & Processing

Key features:

- Suitable for dehydration of fruits, vegetables, herbs, spices, leaves, petals, flowers, and granular materials.
- Advanced, energy-efficient dryer-processor designed to preserve product quality.
- Superior product quality as compared conventional sun, solar, hot air dryer.

Specifications:

- Compact design – 0.8 × 1.7 × 2.2 m
- Capacity: ≈ 5 kg/h for leaves/flowers
- Power requirement – maximum 16 kW

Target users and scale: SHGs, FPOs, and small to medium food processing companies

Field validation status: Validated (prototype available for demonstration).

PUSA COLD MILL



Purpose and field application: Post Harvest Processing & Value Addition – Low temperature grinding

Key features:

- Suitable for grinding of spices at low temperature.
- Eliminates use of liquid nitrogen.
- Produce premium-grade powders with superior flavor and nutritional retention as compared to conventional grinding.
- Operates on single-phase electric current.

Specifications:

- Capacity: 20–30 kg/h
- Power requirement – maximum 9 kW

Target users and scale: SHGs, FPOs, and small to medium food processing companies

Field validation status: Validated (prototype available for demonstration).

PUSA ROTARY ROASTER-PROCESSOR



Purpose and field application: Post Harvest Processing & Value Addition – Roasting and Drying of granular materials.

Key features:

- Suitable for quick roasting and drying of granular and free-flowing materials such as nuts, grains, and grits.
- Ensure uniform heat penetration, resulting in faster processing with precise control over exposure.
- Compact design—0.7 × 1.25 × 2 m

Specifications:

- Capacity: up to 10 kg/h
- Power requirement – maximum 4 kW

Target users and scale: SHGs, FPOs, and small to medium food processing companies

Field validation status: Validated (prototype available for demonstration).

PORTABLE GADGET FOR MATURITY DETECTION IN WATERMELON



Purpose and field application: Quality (maturity) Detection in Watermelon

Key features:

- AI enabled smart gadget to determine maturity of watermelon.
- Categorize watermelon into 3 classes – ripe, unripe and overripe.
- Handheld, portable, battery operated/rechargeable – for on-field application

Specifications:

- Capacity: \approx 150 fruits/h

Target users and scale:

- Crop production: In harvest optimization, quality control and precise selective harvesting of watermelon at right maturity.
- Food processing: For the quality assurance of the produce.
- Logistics: For the real time monitoring of quality in the entire chain.
- Retail: Providing consumers with information about stage of maturity/quality and freshness to increase transparency

Field validation status: Validated.

A SMART HANDHELD DEVICE FOR PRECISE NITROGEN MANAGEMENT IN RICE



Nitrogen (N) is the most critical nutrient for rice productivity, but inefficient N use leads to low NUE (20–40 kg/kg), nitrate leaching and greenhouse gas emissions. Traditional laboratory-based N assessment is destructive and time-consuming. Sensor-based non-destructive methods enable real-time nitrogen monitoring through vegetation indices (VIs).

Existing single-VI devices (e.g., GreenSeeker, SPAD) face limitations at later growth stages and high N levels due to chlorophyll saturation. Hence, a multi-VIs based handheld device was developed for precise N assessment and prescription in direct seeded rice (DSR).

AUTOMATIC SOLAR POWERED BASIN IRRIGATION SYSTEM



Key Technical Features

- Automatic opening/closing of basin gates
- Real-time soil moisture-based irrigation
- Wireless communication among field units
- Solar-powered, low maintenance design
- User dashboard with alert system

Benefits to End Users

- 30–40% water saving
- Reduced labor and field monitoring
- Improved irrigation timeliness
- Better crop health & higher yield
- Scalable across crops and basin geometries

Savings

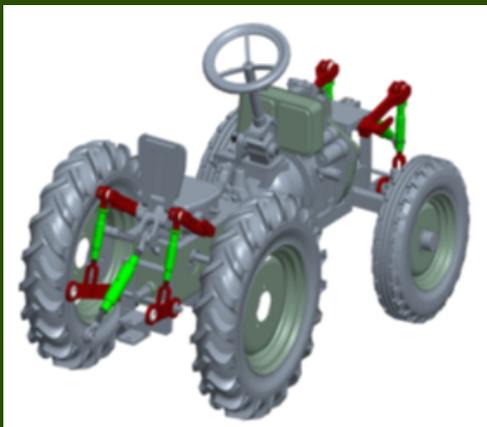
- 70–90% labor reduction
- 30–50% water savings
- Saves electricity

SEMI-AUTOMATIC PINEAPPLE HARVESTER



- To facilitate easy and drudgery free harvesting, a portable battery operated semi-automatic pineapple harvester was designed and field evaluated in NEH regions of India.
- Semi-automatic pineapple harvester is a manually operated harvester consists of grabbing unit, cutting unit, handle and linear actuator and powered by 12V 7Ah lead acid battery.
- Harvesting capacity of the machine is 150-180 number of fruits per hour for injury free and efficient harvesting of pineapples with minimum damage percentage.
- It is suitable for small pineapple growers particularly farmers of hilly regions to boost horticultural mechanization through mechanized pineapple harvesting with higher efficiency.

RIDING TYPE MULTI-UTILITY PRIME MOVER



- Designed and developed for performing multiple small farm operations like rotary tillage, sowing, inter cultural operations, spraying and harvesting.
- It is a power source with compact power train and chassis powered with 10 hp diesel engine
- A chassis of prime movers has been designed inbuilt with hydraulically actuated three-point linkages for efficient mounting and controlling the attachments.
- Additionally, PTO control systems designed for to take power from engine for the for performing operations like roto-tiling, intra row weeder, spraying etc.
- It is economical and efficient power source for small and marginal farmers.

Agricultural Chemical Technologies Ready for Commercialization



GARLIC CLOVES



BIONEMATICIDE

GARLIC BASED PRODUCT AS BIONEMATICIDE

The Garlic-Based Bionematicide Technology is an eco-friendly and effective method for managing root-knot nematodes (*Meloidogyne incognita*), which cause significant damage to agricultural crops. This green technology involves extracting a non-polar fraction from garlic bulbs and formulating an emulsion concentrate that can be applied to the soil. The product is a natural alternative to synthetic nematicides, offering a safer and biodegradable solution for nematode control in crops like tomatoes.

Key Features

- Eco-friendly & biodegradable: Plant-based alternative to toxic synthetic nematicides.
- Highly effective: Causes 61–100% nematode mortality within 24–96 hours (lab studies); proven in greenhouse and field trials on tomato.
- Safe formulation: No organic solvents; harmless to non-target organisms like humans, birds, fish, and bees.
- Flexible application: Suitable for soil drenching and drip irrigation.
- Long shelf life & scalable: Stable up to 2 years; cost-effective production with strong potential to replace restricted chemicals like carbofuran and methyl bromide.

RAW PROPOLIS



PURIFIED PROPOLIS

PROPOLIS PURIFICATION TECHNOLOGY

Process for Purification of Raw Propolis is a technology developed to convert dark raw propolis into a high-quality yellowish or brownish extract rich in bioactive compounds such as phenolics, terpenoids, and flavonoids. The process ensures a high recovery rate (90–95%) and produces purified propolis suitable for use in healthcare, pharmaceuticals, cosmetics, veterinary products, functional foods, and agrochemicals.

Key Features

- Efficient purification with 90–95% recovery of bioactive compounds.
- Rich in terpenoids, phenolics, and flavonoids with antioxidant benefits.
- Wide applications in pharmaceuticals, cosmetics, functional foods, agrochemicals, and veterinary products.
- Lab-validated, scalable, safe, and eco-friendly with 1–2 years shelf life and strong market potential.

PLANT-BASED NEMATICIDE FOR EFFICIENT MANAGEMENT OF ROOT-KNOT NEMATODES



- Plant based nematicide
- Less galls and nematode females
- Comparable to synthetic nematicide
- High efficacy due to reduce size
- Tested for Tomato, Brinjal and Okr

Other technologies ready for commercialization



PUSA MEFLY KIT



PUSA MeFly KIT employs a distinctive and efficient approach to attract and eliminate male fruit flies of the *Bactrocera* species through the use of parapheromone impregnation, and is sufficient for entire season

Key Benefits:

- **Fast & Accurate Detection:** Identifies fruit fly infestation early, preventing major crop damage.
- **User-Friendly & Field Deployable:** Simple to use, requiring no specialized training.
- **Eco-Friendly Solution:** Reduces the need for excessive chemical pesticide application.
- **Cost-Effective Pest Management:** Helps farmers save on crop protection expenses.
- **Scalable for Large-Scale Use:** Suitable for commercial farms, orchards, and research stations.

PUSA WHITEFLY ATTRACTANT



Key Benefits:

- **Boosts Trap Efficiency:** Increases yellow sticky trap catch by 50–300%, improving whitefly monitoring.
- **Eco-Friendly & Cost-Effective:** Leaves no hazardous residue and reduces insecticide use.
- **Field & Greenhouse Compatible:** Effective in open fields and protected cultivation systems.
- **Supports Integrated Pest Management (IPM):** Can be combined with other pest control strategies.
- **Ideal for Organic Farming:** Helps control whiteflies without chemical pesticides.

PUSA CUEFLY KIT



PUSA CueFlyKIT is an adequate approach to attract and eliminate male fruit flies (*Zeugodacus cucurbitae*) using parapheromone impregnation method and can be employed up to three times per season.

Key Benefits:

- **Early Detection & Monitoring:** Helps identify fruit fly infestations before they cause severe damage.
- **Simple & Farmer-Friendly:** Requires no specialized training for use.
- **Eco-Friendly Solution:** Supports integrated pest management (IPM) by reducing chemical pesticide dependency.
- **Cost-Effective & Scalable:** Saves farmers money on pest control and is suitable for large-scale use.
- **Improves Crop Yield & Quality:** Ensures healthier cucurbit crops by controlling pest populations efficiently.

SPEEDYSEED

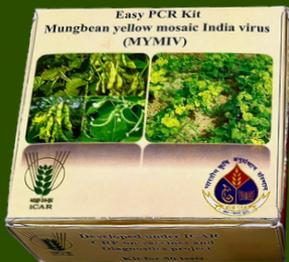


The SpeedySeed Viability Kit is an innovative colorimetric testing method designed to differentiate between viable and non-viable seeds rapidly. Unlike traditional seed germination tests, which can take up to 14 days, this kit provides results within 4 to 8 hours, allowing farmers and seed companies to make quick and informed decisions about seed sowing and marketing.

Key Features of SpeedySeed Viability Kit:

- Fast and reliable seed viability testing within 4-8 hours.
- Works on the principle of seed respiration, detecting CO₂ levels to distinguish live and dead seeds.
- User-friendly – can be performed on-farm by farmers without requiring specialized equipment.
- Cost-effective and time-saving compared to conventional germination tests.
- Beneficial for farmers, seed companies, and the agricultural industry for ensuring seed quality before sowing or sale.
- High commercialization potential due to the universal need for seed viability assessment.

EASY PCR KIT FOR MUNGBEAN YELLOW MOSAIC INDIA VIRUS (MYMIV)



Key Benefits:

- Boosts Trap Efficiency: Increases yellow sticky trap catch by 50-300%, improving whitefly monitoring.
- Eco-Friendly & Cost-Effective: Leaves no hazardous residue and reduces insecticide use.
- Field & Greenhouse Compatible: Effective in open fields and protected cultivation systems.
- Supports Integrated Pest Management (IPM): Can be combined with other pest control strategies.
- Ideal for Organic Farming: Helps control whiteflies without chemical pesticides.

EASY PCR KIT FOR BHENDI YELLOW VEIN MOSAIC VIRUS (BYVMV)



The Diagnostic Kits for Begomoviruses Infecting Okra are PCR-based tools designed to detect Bendi Yellow Vein Mosaic Virus (BYVMV) and Okra Enation Leaf Curl Virus (OELCV). These kits use species-specific primers and a duplex PCR kit for detecting mixed infections. They offer a quick, reliable, and cost-effective solution for breeders and seed companies to identify virus-free plant material, aiding in the development of high-yield, disease-resistant okra varieties. Each kit includes 50 PCR reactions, a manual, positive control, and negative control for accurate and easy diagnosis.

- Species-Specific Detection: Uses novel primers for accurate identification of BYVMV and OELCV.
- Duplex PCR for Mixed Infections: Detects both viruses in a single test, simplifying analysis.
- Easy-to-Use & Reliable: Each kit includes 50 PCR reactions, along with positive and negative controls.
- Rapid & Cost-Effective: Helps breeders and seed companies ensure virus-free plant material.
- Enhances Resistance Breeding: Aids in the selection of high-yield, virus-resistant okra varieties

CRRNA, RPA PRIMERS AND A RAPID, SENSITIVE, SPECIFIC AND FIELD-DEPLOYABLE DIAGNOSTIC PROCESS FOR CHILLI LEAF CURL VIRUS



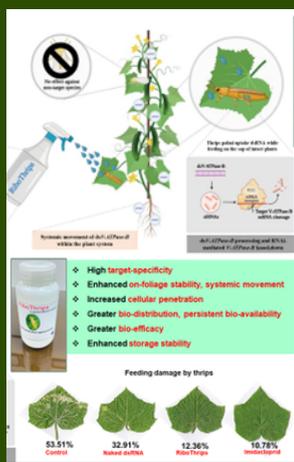
A recombinase polymerase amplification (RPA) assisted CRISPR-Cas12a based detection process has been devised for quick and specific detection of ChLCV in crude leaf extract. The detection of ChLCV can be visualized through a lateral flow assay. The detection method involves cleaving a tagged oligo reporter (Biotin-FAM), allowing results to be visualized via a Lateral Flow Assay (LFA) with gold nanoparticles conjugated with FAM antibody.

Key Features:

- Rapid field-level detection of the chilli leaf curl virus with high specificity and sensitivity
- It is suitable for the early detection of the virus and is helpful for understanding epidemiology and disease distribution.
- Can distinguish ChLCV induced leaf curling from those caused due to mite and thrips damage.
- No laboratory setup required.
- Virus can be detected from crude leaf extract
- Time required for detection/protection and operational simplicity: Can be performed within 1 hour.

Target users: Breeders, Different diagnostic companies can get the licence for bulk production of the kits. The end users could be breeders and seed companies. Breeders and Seed companies can test their promising plant material to ascertain if the plant is free from virus. Thus it will help in developing resistant varieties with high yield. Other university and Institutes working on this field.

RIBOTHRIPS: DSRNA-BASED BIOFORMULATION FOR SUSTAINABLE CROP PROTECTION



RiboThrips (for thrips) and RiboFly (for whiteflies) are next-generation dsRNA-based biopesticides using RNA interference (RNAi) technology for species-specific pest control. By silencing essential genes in sap-sucking pests, the formulation causes mortality, reduces reproduction, and limits virus transmission—without harming pollinators, beneficial insects, or humans.

The technology uses biopolymer nanoparticles to protect dsRNA from degradation, enhance plant absorption, and ensure systemic movement within plants. It provides up to 15 days of pest suppression and protects new growth for over 28 days, with efficacy comparable to chemical insecticides but without toxic residues.

Compatible with standard sprayers and insecticide formulations, stable for over 12 months at room temperature, and scalable for mass production, the platform can be customized for other pests. Overall, it offers a precise, eco-friendly, and sustainable alternative to conventional chemical pest control.

Key Features:

- Customizable – applicable to thrips, whitefly; customizable to other sucking pests such as leafhoppers, mites, including nematodes
- Shelf life >12 months at ambient temperature
- Systemic action, stable on plant foliage
- Highly specific to target pests, safe to non-target organisms
- Insecticidal efficacy comparable to commercial insecticides
- Suppression of virus spread (e.g., Tospoviruses, Begomoviruses)
- Additive phytotonic effect
- Compatible with insecticides as tank mix
- Compatible with standard spray equipment
- Biodegradable and eco-friendly
- No harmful chemical residues
- Supports IPM strategies
- Low risk of resistance development
- Sustainable alternative to conventional chemical pesticides

Food Technologies Ready for Commercialization



MINOR MILLETS PASTA



Product Uniqueness:

- 60% malted millets; goodness of pulses; natural colours; four variants
- Glycemic index of pasta is 39-41 due to lower starch.
- Developed pasta is good source of minerals (iron, zinc) and dietary fibre.
- Natural colourants added to increase colour appeal of the pasta

Health & Nutrition Claims: rich in minerals, fibre; protein enriched

Key Consumer Attractions: Malted minor millets and dals; health, taste and convenience, vegan

Shelf Life & Storage: 4 months; store in dry and cool place

Market Application & Target Segment: health food, convenience food, mass market

CALCIUM FORTIFIED PUMPKIN CRISP



Product Uniqueness: Calcium enriched, healthy snack, atmospheric frying technology; simple technology, suitable for small scale processing, patent filed

Salient Features:

- Deep fried, simple technology
- Total carotenoids (7.52-8.16 mg/ 100g; 69.64% retention)
- Per serving of 30g meets 42.8% RDA calcium requirement of adults

Health & Nutrition Claims: carotenoids and fibre rich

Key Consumer Attractions: healthy veggie snack

Shelf life: 3 months at room temperature in ALPE packs, FFA <1%

Market Application & Target Segment: health food, convenience food, mass market

LENTIL CRACKERS



Product Uniqueness: 100% lentils, no other grain, made from biofortified lentils, simple technology, suitable for small scale processing; clean label, baked, not fried

Salient Features:

- Deep fried, simple technology
- Total carotenoids (7.52-8.16 mg/ 100g; 69.64% retention)
- Per serving of 30g meets 42.8% RDA calcium requirement of adults

Health & Nutrition Claims: carotenoids and fibre rich

Key Consumer Attractions: healthy veggie snack

Shelf life: 3 months at room temperature in ALPE packs, FFA <1%

Market Application & Target Segment: health food, convenience food, mass market

LOW CALORIES AONLA CANDY



Product Uniqueness: No sucrose added, lower calorie, faster process

Health & Nutrition Claims: higher vitamins and antioxidants, attractive colour

Key Consumer Attractions: doesn't harm teeth, suitable for diabetics

Shelf life: 4 months; store in dry and cool place

Market Application & Target Segment: diabetics, weight watchers

FINGERMILLET CRACKERS



Product Uniqueness:

- low fat, contain finger millet and dal; simple technology, suitable for small scale processing
- Retain the goodness of basic crackers besides providing
- Micronutrients
- Lower in calories, fat
- 60% less fat (non-hydrogenated)
- Higher in protein, Fibre, nutrients derived from natural sources
- Higher in minerals, antioxidants and phenols

Health & Nutrition Claims: protein, rich in minerals, fibre

Key Consumer Attractions: health, taste and convenience

Shelf Life & Storage: 4 months; store in dry and cool place

Market Application & Target Segment: health food, convenience food, mass market

VACUUM FRIED FRUITS AND VEGETABLE CRISPS



Product Uniqueness:

- healthier snack for munching.
- can be made from many fruits and vegetables (guava, broccoli, red cabbage, pumpkin, carrot, ber)

Health & Nutrition Claims: retain vitamins, colour and taste

Key Consumer Attractions: rich in minerals, fibre

Shelf life: 4 months; store in dry and cool place

Market Application & Target Segment: health food, convenience food, mass market

MILLET WAFFLES/ PANCAKE MIX



Product Uniqueness: healthier snack; contains four millets

Health & Nutrition Claims: convenient and tasty, ready to prepare

Key Consumer Attractions: rich in minerals, fibre

Shelf life: 4 months; store in dry and cool place

Market Application & Target Segment: health food, convenience food, children and youngsters, school/ college canteens

PROCESS PROTOCOL FOR NUTRI-RICH DEHYDRATED CARROT WITH IMPROVED TEXTURE



Purpose and field application: Post Harvest Processing & Value Addition – Dehydration of carrot.

Key features:

- Unique drying process protocol to produce nutrient-dense, crunchy dried carrot shreds with excellent rehydration.
- Better textural and nutritional quality as compared to hot air drying/sun drying.

Specifications: High carotenoid, flavour, colour and antioxidant retention.

Target users and scale: SHGs, FPOs, and small to medium food processing companies

Field validation status: Validated.

PROCESS PROTOCOL FOR DEHYDRATION OF APPLE SLICES



Purpose and field application: Post Harvest Processing & Value Addition – Dehydration of apple.

Key features:

- Natural (chemical-free) anti-browning treatment.
- Unique drying process protocol to produce nutrient-dense, crunchy dried apple chips.
- Better textural and nutritional quality as compared to hot air drying/sun drying.

Specifications: High flavour, colour and antioxidant retention

Target users and scale: SHGs, FPOs, and small to medium food processing companies

Field validation status: Validated.

FAST FEAST: INSTANT PEARL MILLET DALIA

Fast Feast: Instant Pearl Millet Dalia is a ready-to-eat nutritious breakfast meal developed to provide a healthy and convenient food options for all the age groups. Made from pearl millet, a nutrient-dense grain, this product comes in both sweet and savory flavors, making it a versatile and easy-to-prepare meal.

Key Features of the Product:

- Made from pearl millet, which is rich in protein (9-21%), fiber (8-13%), and essential nutrients like iron and zinc.
- Available in two flavors: Sweet (just add hot milk and sugar) and Savory (with a unique magic masala blend).
- Includes dehydrated vegetables like carrots and green peas for added nutrition and taste.
- Requires only hot water or hot milk for instant preparation.
- Ideal for breakfast, travel, and areas with limited cooking facilities.
- Shelf life of up to 6 months without rancidity, maintaining its nutritional quality.



HYDRO, HYDRO- THERMAL AND THERMAL NEAR INFRARED TREATMENTS TO REDUCE RANCIDITY IN PEARL MILLET FLOUR

- Pearl millet is a nutrient-dense grain with high protein (12-15%), iron (11.2 mg/100g), and zinc (5-7 mg/100g), along with a high PUFA content (70% of total lipids), making it a valuable source of energy and essential nutrients. However, its high-fat content leads to rancidity, limiting its shelf life and commercialization potential.
- Extends the shelf life of pearl millet flour up to 6 months by preventing rancidity.
- Uses hydro, hydrothermal, and near-infrared ray treatments without chemicals.
- Retains high nutritional value, including protein, iron, zinc, and PUFA.
- Enhances commercial viability for bakery, infant foods, beverages, and health drinks.
- Supports gluten-free, diabetic-friendly, and heart-healthy food markets.



DIVINE DOUGH – A FORTIFIED FLOUR FOR BALANCED NUTRITION

Divine Dough is a specially formulated flour developed using pearl millet as a base, enriched with buckwheat, resistant starch from sweet potato, chickpea protein, and iron/zinc from barnyard millet. This nutrient-rich flour is designed to offer a low-glycemic index (GI) option, making it ideal for diabetic individuals and health-conscious consumers. The formulation ensures a balanced intake of macronutrients and micronutrients while maintaining a great taste and making fluffy chapattis with easy dough preparation.

Key Features of Divine Dough:

- Fortified with essential nutrients, including quality protein, fiber, iron, and zinc.
- Low Glycemic Index (GI: 47), suitable for diabetics and all age groups.
- Chemical-free starch extraction from sweet potato, converted into resistant starch.
- Easy to prepare dough that forms soft, gluten-free chapattis.
- Rich in dietary fibre and resistant starch to aid digestion and gut health.
- A balanced mix of grains: Pearl millet, Buckwheat, resistant starch from sweet potato, Chickpea protein, and Barnyard millet.



WELLNESS CHOICE – PEARL MILLET FLOUR MIX (GLUTEN FREE) FOR SOFT AND FLUFFY DOUGH

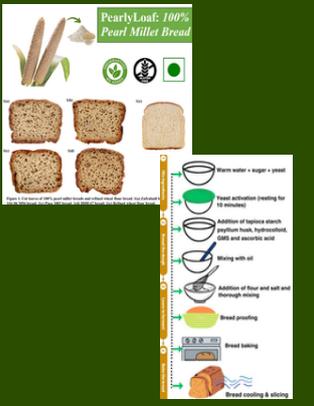


The Wellness Choice Pearl Millet Flour Mix is a gluten-free flour blend designed to create soft and fluffy dough for bakery applications like bread, pizza, burgers, and cakes. This formulation replaces gluten-based structure-building proteins with hydrocolloid-binding agents, ensuring excellent viscoelasticity, film-forming ability, and high water absorption capacity. The product is a healthier alternative for individuals with celiac disease, gluten intolerance, and those seeking nutritious options.

Key Features & Benefits:

- 100% Gluten-Free: Suitable for individuals with celiac disease and gluten sensitivity.
- Soft & Elastic Dough: Achieves wheat-like texture without gluten.
- Nutrient-Rich: High in iron, zinc, and protein, making it a better alternative to refined flours.
- Versatile Applications: Ideal for making bread, cakes, pizza, and burger buns.
- Highly Acceptable Taste & Texture: Rated 9/10 in sensory evaluation tests.

PEARLY LOAF: 100% PEARL MILLET BREAD PRE-MIX. MILLET MAGIC IN EVERY SLICE



PearlyLoaf is a scientifically formulated gluten-free bread pre-mix made exclusively from whole pearl millet flour (*Pennisetum glaucum*). This innovative product addresses the challenges of gluten-free baking by incorporating hydrocolloids like Hydroxypropyl Methylcellulose (HPMC) to replicate the structural and functional properties of gluten. It ensures better texture, loaf volume, and overall bread quality, making it an excellent alternative to wheat bread for health-conscious consumers and individuals with gluten intolerance or celiac disease.

Key Features & Benefits:

- 100% Gluten-Free & Wheat-Free: Safe for individuals with celiac disease and gluten sensitivity.
- Rich in Dietary Fiber & Essential Nutrients: Pearl millet is a whole grain powerhouse with high fiber, vitamins, and minerals.
- Low Glycemic Index (GI: 68-69%) – Helps manage blood sugar levels, making it ideal for diabetics.
- High Consumer Acceptance: Rated 8/9 on sensory evaluation, ensuring excellent taste and texture.
- Versatile & Easy to Use: Pre-mix format simplifies bread-making for home bakers and commercial bakeries.

SMART FLOUR: RICH IN RETROGRADED RS TYPE III

Smart Flour is an innovative, health-focused flour enriched with Resistant Starch Type III (RS III) using a novel physico-enzymatic processing method. This specially developed flour is designed to support better blood sugar management, gut health, and overall well-being, making it an excellent dietary choice for diabetics and health-conscious consumers.

Key Features & Benefits:

- Rich in RS III (up to 300% increase) – Enhances digestion, gut health, and blood sugar regulation.
- Ideal for Diabetics & Health Enthusiasts – Low glycemic index, helping in diabetes management.
- Versatile Applications – Can be used for chapattis, bread, and baked goods, replacing conventional rice flour.
- Optimized through Microwave, Autoclave & Enzyme Treatment – Ensures better texture and nutritional quality.
- Cost-Effective & Scalable – Developed using a low-cost, robust processing method, making it suitable for large-scale production.

