

Technologies Commercialized

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Cotton Stalk Puller

Salient features

- Manually operated by single person to uproot the cotton stalks.

Performance

- Effective field capacity : 0.025 ha/h

Cost

- Unit cost : ₹ 700

Impact and benefits

- Uprooting of cotton stalks requires less force due to firm grip of jaws and mechanical advantage of the lever arm.
- Reduction in drudgery in cotton stalk uprooting.

Manufacturer

- M/s Samad Engg Works
Parbhani (Maharashtra)



Contact

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College of Agricultural Engineering
Marathwada, Krishi Vidyapeeth, Parbhani 431402 (Maharashtra)

Animal Drawn Tendua Iron Plough

Salient features

- Tendua iron plough developed as substitute to traditional wooden plough of Chhattisgarh. A steel shovel is fixed at lower end of plough, which can be replaced after being worn out.



Dimension (l×w×h) : 23×7.5×620 mm

Weight with beam : 22.5 kg

Performance

- Field capacity : 0.015 ha/h
- Draught : 634 N
- Power required : 0.38 kW

Cost

- Unit cost : ₹ 2,000

Impact and benefits

- Working life increases to 5 years compared to 2 years of traditional wooden plough and higher field capacity.
- Reduced cost of cultivation due to improvement in service life.

Manufacturers

- M/s Batala Engineering Works
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Animal Drawn Improved Blade Harrow

Salient features

- Blade harrow is used for shallow tillage, weed control and *in-situ* soil moisture retention. The blade width has been standardized as 600 mm for bullocks of Madhya Pradesh. One roller attachment has been provided for light pressing of top soil.

Blade size : 600 mm

Weight : 65 kg



Performance

- Draught : 60 kg
- Field capacity : 0.072 ha/h

Cost

- Unit cost : ₹ 2,500
- Cost of operation : ₹ 365 /ha

Impact and benefits

- Life of improved blade harrow is 5 years as compared to 2 years of traditional blade harrow. Due to proper matching of blade size as per draught ability of bullocks, it is possible to achieve a higher field capacity (0.072 ha/h) for improved blade harrow as compared to conventional blade harrow (0.059 ha/h). There is a saving in ₹ 92/ha for each operation of blade harrow.

Manufacturers

- M/s Narayana Agril.Works
Dewas Indore Road, Dewas (Madhya Pradesh)
- M/s Farm Tools Works
PO - Khurai, Sagar (Madhya Pradesh)
- Prototype Production Centre
Central Institute of Agricultural Engineering, Bhopal 462038 (Madhya Pradesh)

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Animal Drawn IGKV Biasi Plough

Salient features

- Biasi is a traditional intercultural operation carried out in line sown/ broadcast rice in paddy fields under standing water. The tynes are made of MS flat and the desired curvature is given to the tynes by forging. A shoe type furrow opener is used.

Dimensions (l×w×h) : 800×500
×850 mm

Ground clearance : 285 mm

No. of tynes : 3

Spacing of tynes : 200 mm



Performance

- Field capacity : 0.11 ha/h
- Draught : 550-650 N

Cost

- Unit cost : ₹ 4,500
- Cost of operation : ₹ 600 / ha

Impact and benefits

- As compared to the traditional plough, there is 50% saving in time and cost of operation.
- Improvements in traditional technology, therefore, ease in adoption and higher social acceptance.

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Wheeled Type Multipurpose Tool Carrier

Salient features

- Consists of a rectangular shaped toolbar frame, pneumatic wheels with screw jack and beam. Operations possible with tool frame are ploughing, secondary tillage with cultivator, sowing, bed forming, and bund making. In addition it has a trailer attachment as well as provision for attaching water tank.



Performance

- Field capacity : 0.05-0.32 ha/h with different attachments
- Draught : 280-710 N

Cost

- Unit cost : ₹ 30,000
- Cost of operation : ₹ 170- 1,000/ha

Impact and benefits

- The major advantages are 300-400% increased field capacity.

Manufacturers

- M/s M.M. Engineering Works
M. I.A. Near UCCI Office, Road No. 12, Plot No. G1-469B
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- M/s Kalpana Enterprises
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Tractor Operated Peg Type Puddler

Salient features

- The puddler is operated in 50-100 mm of standing water and produces a good puddle.

Dimension (l×w×h) : 2,000×630×
680 mm

Weight : 90 kg



Performance

- Field capacity : 0.40 ha/h

Cost

- Unit cost : ₹ 9,000
- Cost of operation : ₹ 800-1,000/ha

Impact and benefits

- It saves two passes and ₹ 2,200/ha. It can cover 12 ha more command area in a season of 100 h of use. The economic benefit per unit per season is ₹ 26,000.
- Reduces drudgery and allows timeliness of operation.

Manufacturers

- M/s Mahindra and Mahindra Ltd.
FES Tractor Division, Akurli Road, Kandivli East,
Mumbai 400 101 (Maharashtra)
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Tractor Operated Post Hole Digger

Salient features

- Consists of an auger driven through tractor power take off for plantation of horticultural and forestry crop. The size of auger defines the size of pit formed. The augers of size 450 -600 mm diameter and 900 mm working length are commonly used.



Performance

- Capacity : 40-50 pits/h

Cost

- Unit cost : ₹ 60,000
- Cost of operation : ₹ 450/h

Impact and benefits

- Easy to operate with higher output capacity besides timeliness of operation, and considerable saving of manual labour, time and money.

Manufacturers

- M/s Jhandeana Industries
C-70, Focal Point, G.T. Road, Moga 142 001 (Punjab)
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CRR I Manual Drum Seeder

Salient features

- Suitable for seeding of rice in puddled soil.

| | | |
|--------------|---|--------------------------|
| Dimension | : | 1,800×1,540× 1,320 mm |
| Row spacing | : | 150-200 mm |
| Hill spacing | : | 100-150 mm |
| Seed rate | : | 60-80 kg/ha |
| Weight | : | 10 kg |



Performance

- Field capacity : 0.057 ha/h

Cost

- Unit cost : ₹ 5,500
- Cost of operation : ₹ 800/ha

Impact and benefits

- The weeding of drum-seeded rice field can be easily done using paddy weeder.
- Net manpower saving of 148 man-hours/ha and 70% time.
- Reduces drudgery of the rice cultivators.

Manufacturers

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CRRRI Manual Rice Transplanter

Salient features

- A manually operated implement suitable for transplanting of rice seedling in puddled soil.
Type of seedling : Mat type
Tray size : 480×220×15 mm



Performance

- Field capacity : 0.02 ha/h

Cost

- Unit cost : ₹ 7,000
- Cost of operation : ₹ 2,416/ha

Impact and benefits

- Reduces drudgery
- Avoid bending posture of farm women for longer duration

Manufacturers

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CRRRI Two-Row Manual Seed Drill

Salient features

- It is useful for line sowing of rice for wet and dry soil condition. It saves seed and labour.

| | | |
|-------------|---|--------|
| No. of rows | : | 2 |
| Row spacing | : | 200 mm |



Performance

- Field capacity : 0.05 ha/h

Cost

- Unit cost : ₹ 1,500
- Cost of operation : ₹ 950/ha
- Payback period : less than a year

Impact and benefits

- The ease in weeding operation, using paddy weeder, in line sown paddy field.
- Saving in time and manpower.
- Ease in adaptation owing to less weight.
- It reduces drudgery of farmers in seeding and weeding operation.

Manufacturers

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Manual Onion Drum Seeder

Salient features

- Dimension (l×w×h) : 580×250× 600 mm
- No. of rows : 7
- Spacing : 80 mm

Performance

- Field capacity : 0.1 ha/h



Cost

- Unit cost : ₹ 2,000
- Operating cost : ₹ 300/ protray/ha

Impact and benefits

- Saving in seed
- Increased yield
- Easy in adoption
- Labour and time saving:50%

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West). Upparahalli Main Road
Tumkur 572 102 (Karnataka)
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Multi-Row Manual Jute Seed Drill

Salient features

- Manually operated four and five rows seed drill for fibre crop and three rows for jute seed crop.
- | | |
|--------------------|----------------------------|
| Size (l×w) | : 1,490× 1,040 mm |
| Row-to-row spacing | : 200 mm |
| Weight | : 13.5-17 kg for four rows |
| Seed rate | : 2.6-2.75 kg/ha |



Performance

- Field efficiency : 84 to 91%
- Speed of operation : about 2.0 km/h
- Effective field capacity : 0.18-0.20 ha/h

Cost

- Unit cost : ₹ 3,400 for four rows
: ₹ 3,670 for five rows
- Cost of operation (Rs/h) : ₹ 25/h

Impact and benefits

- Seed drill saves more than 55-60 man-days/ha.
- Farmers can earn more than ₹ 4500/ha extra owing to higher fibre yield as compared to conventional practice.
- It saves more than 60-65% quality seed over conventional.
- It uplifts the socio-economic conditions of the jute growing resource poor farmers.

Manufacturers

- M/s Mettle Engineering Company
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Manually Operated Eight-Row Improved Direct Paddy Seeder

Salient features

- Eight-row improved direct paddy seeder has four seed hoppers, pair of ground wheels, main shaft and harness. A swinging handle is provided with the unit for pulling the seeder. It can be carried to the field and operated comfortably by one worker.



| | |
|-------------------|--------------------|
| Dimension (l×w×h) | : 680×1,700×600 mm |
| Weight | : 8.5 kg |
| Draft | : 168 N |
| Working width | : 1,600 mm |
| Operating speed | : 1 km/h |
| Power requirement | : one person |

Performance

- Field capacity : 0.125 ha/h

Cost

- Unit cost : ₹ 4,700
- Cost of operation : ₹ 500/ha

Impact and benefits

- Ensures uniform rate of sowing.
- Total duration of crop reduces by 10-15 days.
- About 40% saving in seed rate and 90% saving in cost and time.

Manufacturers

- M/s KSNM Marketing
SF No. 29/1B, Ona Palayam Siruvani Water Line Road,
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Women Friendly Direct Paddy Seeder

Salient features

- The ergo-refined four - row direct paddy seeder consists of two numbers of seed hoppers, a pair of ground wheels, main shaft and harness. A swinging handle is provided for pulling the seeder. The unit can be operated comfortably by a woman worker.

Dimension (l×w×h) : 1,680×9,200×600 mm

Weight : 7.2 kg

Draft : 95 N

Working width : 800 mm

Operating speed : 1 km/h

Power requirement : one person



Performance

- Field capacity : 0.06 ha/h

Cost

- Unit cost : ₹ 4,000
- Operating cost : ₹ 1,000 /ha

Impact and benefits

- Ensures uniform rate of sowing.
- Total duration of crop reduced by 10-15 days.
- Saving in 40% seed and 60% in cost and time.
- Worker friendly technology.
- Environment friendly technology as the crop duration and thereby field exposure for green house gas emission is reduced by 10-15 days.

Manufacturers

- M/s KSNM Marketing
SF No. 29/1B, Ona Palayam Siruvani Water Line Road,
Dheenam Palayam Post, Coimbatore 641109 (Tamil Nadu)
Tel.: 0422-3251175, E-mail: ksnm@hotmail.com

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AICRP on Ergonomics and Safety in Agriculture,
Central Institute of Agricultural Engineering, Nabi Bagh, Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2747430 Fax: 0755-2743016
E-mail: director@ciae.res.in

Women Friendly Fertilizer Broadcaster

Salient features

- It consists of feed hopper with plastic lid, agitator, rotor plate, handle, feed control lever, gear and straps. The unit is hung in front of body.

Dimension (d×h) : 290×350 mm

Weight : 3.5 kg (8.5 kg with fertilizers)

Working width : 5 m swath

Operating speed : 3.9 km/h

Power requirement : one person



Performance

- Field capacity : 1.0 ha/h

Cost

- Unit cost : ₹ 2,000
- Cost of operation : ₹ 27/h

Impact and benefits

- Increases efficiency of worker thrice than the traditional method.
- Uniform application of fertilizer.
- Avoids hand contact with fertilizer.
- Women friendly technology.
- Reduces drudgery of women in agriculture.
- Helps to avoid skin contact of hands with fertilizer thereby reducing health hazards.

Manufacturers

- M/s Satish Agro Industries
Off: 1/1 Maharani Road (Shrinath Chambers)
Indore 452007 (Madhya Pradesh)
Tel.: 0731-2531038, 2537776
E-mail: pragaton@gmail.com

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Tel.: 0755-2747430 Fax: 0755-2743016
E-mail: director@ciae.res.in

Animal Drawn Three - Row Seed-cum-Fertilizer Drill

Salient features

- It consists of main frame, seed and fertilizer boxes, seed metering mechanism, furrow openers, depth-cum-transport wheels and drive mechanism. A tool bar is provided with a number of holes to vary the row-to-row spacing of furrow openers

Dimensions (l×w×h) : 1,000×1,000×780 mm

Weight : 50 kg

Draft : 500 N

Working width : 225-700 mm

Operating speed : 2.0-2.5 km/h

Manpower requirement : 4-10 man-h/ha



Performance

- Field capacity : 0.10-0.15 ha/h
- Field efficiency : 65-70%

Cost

- Unit cost : ₹ 9, 000
- Operating cost : ₹ 350-500/ha

Impact and benefits

- This machine can sow the entire crop and apply fertilizer in rows.
- Useful to the farmers for precise as well as timely operations.

Manufacturers

- M/s Suraj Sales Corporation
F-20 Ami Akhand Anand Society opposite Purvdeep Society
Near CTM Cross Road N.H. No 8 Amraiwadi,
Ahmedabad 380026 (Gujarat) Tel.: 079-25854939, 65417972
- M/s Shri Manak Industries
Bhopal (Madhya Pradesh)
- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel: 0755-2589119
- M/s NAFED Krishi Yantra Udyog, B-481, Industrial Estate,
Bhiwadi 381001 Alwar (Rajasthan)

Contact

Director

Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)

Tel.: 0755-252001, 2737191 Fax: 0755-2734016

E-mail: director@ciae.res.in

Animal Drawn Rice Drum Seeder

Salient features

- It is suitable for line sowing of rice. The unit consists of a simple frame on which the seed box, fertilizer box, hitch bracket, handle, clutch mechanism and furrow closure are mounted. The provision of clutch facilitates stopping of seed dropping at headlands. Seeds drop uniformly 200 mm apart in eight rows at a depth of 20 to 50 mm.



Performance

- Draft : 60-70 kgf
- Field efficiency : 60-70%
- Field capacity : 1.80-2.00 ha/day

Cost

- Unit cost : ₹ 6,000

Impact and benefits

- Proper placement of seed results in 30 to 40% savings of seed.
- Intercultural operations can be done easily between the rows.

Manufacturers

- M/s OKASU Engineering Pvt. Ltd.
Dogar Complex, Station Road, Raipur (Chhattisgarh)
Tel: 0771-4073006/07 Fax: 0771-2887001
- M/s Batala Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur (Chhattisgarh)
Phone: 0771-6065555 Email: batalaengg@gmail.com
- M/s Dandekar Fabricator, Near High school
Tamaseoni, Arang, Raipur (Chhattisgarh)
Tel.: 09754956717

Contact

Research Engineer
AICRP on Utilization of Animal Energy
College of Agricultural Engineering
Indira Gandhi Krishi Vishwavidyalaya, Raipur 492012 (Chhattisgarh)
Tel.: 0771-2442575 Fax: 0771-2442131
E-mail: sjogdand2000@yahoo.com

Animal Drawn Bhoram Deo Seed Drill

Salient features

- A 4-row animal operated seed drill. Suitable for line sowing of paddy, wheat, gram, peas, soybean and linseed. It is used for both *rabi* and *kharif* crops.
- The metering of seed is done manually.
- Two additional persons required to meter the seed. Intercultural operations can be done easily.



Performance

- Operating speed : 2.5-3.0 km/h
- Draft : 60 - 70 kgf
- Field efficiency : 60-70%
- Field capacity : 0.8 - 1.0 ha/day

Cost

- Unit cost : ₹ 1,800

Impact and benefits

- Saving in cost of operation.
- Environment friendly.

Manufacturers

- M/s OKASU Engineering Pvt. Ltd.
Dogar Complex, Station Road, Raipur (Chhattisgarh)
Tel: 0771-4073006/07 Fax: 0771-2887001
- M/s Batala Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur (Chhattisgarh)
Tel.: 0771-6065555 Email: batalaengg@gmail.com

Contact

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Tel.: 0771-2442575 Fax: 0771-2442131
E-mail: sjogdand2000@yahoo.com

Animal Drawn VL Seed-cum-Ferti Drill

Salient features

- Dimension (l×w×h) : 640×500×900 mm
- Number of rows : Two
- Row spacing : 150-250 mm
- Weight : 23 kg



Performance

- Field capacity : 0.05-0.09ha/h

Cost

- Unit cost : ₹ 3,200

Impact and benefits

- Increases working efficiency.
- Saves energy.
- Reduces drudgery.
- Light in weight and easy to adopt by hill farmers.

Manufacturers

- M/s Punjab Agricultural Implements (P) Ltd.
Saharanpur, (Uttar Pradesh)

Contact

Director

Vivekanand Parvatiya Krishi Anusandhan Sansthan, Almora 263601 (Uttarakhand)

Tel.: 05962-230208, 2030060

E-mail: vpkas@nic.in

Animal Drawn Seed-cum-Ferti Drill

Salient features

- A bullock operated equipment suitable for sorghum, wheat, mung, soyabean, etc.

Performance

- Field efficiency : 84.6%
- Field capacity : 2.17 ha/day

Cost

- Unit cost : ₹ 8,000

Impact and benefits

- Reduces labour requirement.
- Saves in seed and fertilizer.

Manufacturers

- M/s Samad Engg Works
Parbhani (Maharashtra)



Contact

Head

Department of Farm Machinery and Power
College of Agricultural Engineering
Marathwada Krishi Vidyapeeth, Parbhani 431402 Maharashtra

Rabi Seed-cum-Ferti Drill

Salient features

- A bullock operated equipment suitable for sorghum, wheat, mung, gram etc. under dry land conditions.



Performance

- Field efficiency : 80
- Field capacity : 1.67 ha/day

Cost

- Cost of implement : ₹ 3,500

Impact and benefits

- Savings of seed and fertilizer.
- Delayed sowing in *rabi* possible, as it works at 130 mm depth where soil moisture is available.

Manufacturers

- M/s Samad Engg Works
Parbhani (Maharashtra)

Contact

Head

Department of Farm Machinery and Power
College of Agricultural Engineering
Marathwada Krishi Vidyapeeth, Parbhani 431402 (Maharashtra)

Indira Seed-cum-Fertilizer Drill (Animal Drawn)

Salient features

- Suitable for line sowing of paddy, wheat, gram, peas, soybean and linseed.

Performance

- Field efficiency : 60-70%
- Draft : 65-75 kgf
- Field capacity : 1.00 ha/day



Cost

- Unit cost : ₹ 5,600

Impact and benefits

- Saving in cost of operation.

Manufacturers

- M/s OKASU Engineering Pvt. Ltd.
Dogar Complex, Station Road, Raipur (Chhattisgarh)
Tel.: 0771-4073006/07 Fax: 0771-2887001
- M/s Batala Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur (Chhattisgarh)
Tel.: 0771-6065555 Email: batalaengg@gmail.com
- M/s Dandekar Fabricator, Near High school
Tamaseoni, Arang, Raipur (Chhattisgarh)
Tel.: 09754956717

Contact

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Indira Gandhi Krishi Vishwavidyalaya, Raipur 492012 (Chhattisgarh)
Tel.: 0771-2442575 Fax: 0771-2442131
E-mail: sjogdand2000@yahoo.com

Animal Drawn Three-Row Inclined Plate Planter

Salient features

- It is multi-crop planting equipment suitable for sowing of crops like groundnut, maize, pigeonpea, mustard, gram, soybean, etc. The planter has been provided with three modular design seed boxes with independent inclined plate type seed metering mechanism. Seed box-furrow opener units are adjustable for sowing seeds at different row-to-row spacings.
- Shoe type furrow openers ensure low draft requirement of the machine. Seed plates can easily be changed for sowing different crops. It is also suitable for sowing of intercrops.

| | |
|--------------------|--------------------------------|
| Dimension (l×w×h) | : 1,200×1,300×900 mm |
| Power source | : Medium size pair of bullocks |
| Labour requirement | : 7-8 man-h/ha |

Performance

- Field capacity : 0.16 - 0.2 ha/h (for row spacing of 250-450 mm)
- Field efficiency : 60 to 70%

Cost

- Unit cost : ₹ 15,000
- Operating cost : ₹ 300-400/ha

Impact and benefits

- Use of planter would result in saving of seed (up to 20%).
- Timely completion of operation.
- The use of planter would also result in up to 20% increase in productivity owing to uniform and accurate placement of seed.
- Use of the equipment results in reduced human drudgery and saves farmer's time.

Manufacturers

- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh) Tel.: 0755-2581683
- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Vasundhara Krishi Yantra Udyog
Nishatpura East, Berasia Road Bhopal (Madhya Pradesh)
Tel.: 0755-2733334

Contact

Director

Central Institute of Agricultural Engineering, Bhopal 462038 (Madhya Pradesh)

Tel.: 0755-2737191 Fax : 0755-2734016

E-mail director@ciae.res.in

Zero-Till Drill (Power Tiller Operated)

Salient features

- Dimension (l×w×h) : 775×770×790 mm
- Weight : 49 kg
- Power source : 7-9 kW power tiller
- Row spacing : 220 mm (3-row)
- Power requirement : 20 man-h/ha



Performance

- Field capacity : 0.10 ha/h
- Field efficiency : 62.5%

Cost

- Initial investment : ₹ 22,000
- Cost of operation : ₹ 1,225/ha

Impact and benefits

- Saving of 60-63% as compared to traditional method.
- Energy saving technology.
- Conservation tillage technology.

Manufacturers

- M/s National Agro Industries
Link Road, Industrial Area- A. Opp. Transport Nagar,
Street No. 3, Ganesh Nagar Ludhiana 141003 (Punjab)
Tel.: 0161-2222041, 5087853 Fax:0161-4621299
E-mail: sales@nationlagro.com

Contact

Head
Department of Agricultural Engineering
CSK HPKV, Palampur 176062 (Himachal Pradesh)
Telefax: 01894-230956

CRR I Tractor Operated Seed Drill

Salient features

- A tractor drawn seed drill useful for line sowing of rice .
Source of power : 22 kW

Performance

- Field capacity : 0.38 ha/h

Cost

- Unit cost : ₹ 35,000
- Cost of operation : ₹ 625 /ha

Impact and benefits

- Rice sowing with seed drill is advantageous where, time available for sowing is short and nursery raising is difficult.
- Weeding can be done easily as sowing is done in line.
- It saves time and labour and reduces drudgery.

Manufacturers

- Odisha Farm Machinery Research and Development Centre (OF MRDC)
Satya Nagar Bhubaneswar 751007, (Odisha)
Tel.: 0674-2572710, 0674-2571860
E-mail: ofmrhc.dag@nic.in



Contact

Director
Central Rice Research Institute
Cuttack 753006 (Odisha)
Tel.: 0671-2367777-287
E-mail: directorcrrri@sify.com, crrictc@nic.in

Tractor Operated Zero-Till Drill

Salient features

- Suitable to sow wheat directly in rice-harvested fields without preparing the seedbed
- | | | |
|--------------------|---|-------------------|
| Furrow openers | : | Inverted 'T' type |
| Number of rows | : | 9 / 11/ 13 |
| Row-to-row spacing | : | Adjustable |



Performance

- Field capacity : 0.3-0.4 ha/h
- Efficiency : 75%

Cost

- Unit cost : ₹ 35,000-40,000
- Cost of operation : ₹ 1,000-1,200/ha

Impact and benefits

- It saves ₹ 1,500-2,000/ha in the cost of wheat production.
- Saving 50-60% time and 40-50% cost of sowing as compared to the conventional practice
- Reduces energy and time requirement during peak season.

Manufacturers

- M/s Dashmesh Mechanical Works
Nabha-Maler Kotla Road, Amargarh, Distt. Sangrur 148022 (Punjab)
Tel.: 0675-284221 E-mail: info@dasmesh.net
- M/s Azad Engineering Works
Jhansa Road, Thanesar, Kurukhsetra (Haryana) Tel.: 01744-235432
- M/s Beri Udyog (P) Ltd.
100-101/3, HSIDC, Karnal 132001 (Haryana)
Tel.: 0184-2221571-72 E-mail: info@fieldking.com
- M/s Janta Agriculture Implements
New Karnal Road, Near Govt. School 4 , Kaithal (Haryana)
Tel.: 01746-229541
- M/s Khalsa Engg. Works
Tohana, Hissar (Haryana) Tel.: 094162-93019

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Central Institute of Agricultural Engineering
Nabi Bagh ,Berasia Road, Bhopal 462038 (Madhya Pradesh)
Telefax: 0755-2733385 fim@ciae.res.in
E-mail: director@ciae.res.in

Tractor-Operated Strip Till drill

Salient features

- It is essentially 9 or 11 row seed-cum-fertilizer drill with a rotary blade attachment.
- Minimum soil manipulation running ahead of the normal furrow openers.
- Power requirement : 26 kW or more



Performance

- Field capacity : 0.3 ha/h
- Field efficiency : 70%

Cost

- Unit cost : ₹ 1,25,000
- Cost of operation : ₹ 1,500-2,000/ha

Impact and benefits

- Time saving of 65 to 70% in comparison with the conventional tillage planting .

Manufacturers

- M/s Dashmesh Mechanical Works
Nabha-Maler Kotla Road, Amargarh, Distt. Sangrur 148022 (Punjab)
Tel.: 01675-284221
E-mail: info@dasmesh.net

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Tractor Operated 6-Row Inclined Plate Planter

Salient features

- It is suitable for planting groundnut, gram, soybean, mustard, etc. It has separate seed box and inclined plate metering units for each row.

Dimensions (l×w×h) : 2,500×1,215
×1,010 mm

Number of rows : 6 (250 to
450 mm)

Power source : Tractor 22.5 kW or more



Performance

- Field capacity : 0.45-0.65 ha/h
- Field efficiency : 70 to 75 %

Cost

- Unit cost : ₹ 46,000
- Operating cost : ₹ 800-900/ha

Impact and benefits

- Use of planter results in saving of seed (up to 20%) and timely completion of operation. Uniform and accurate placement of seed results in up to 20% increased productivity.

Manufacturers

- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683
- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Yashodha Engineering
Shop No. 14, New Rajiv Nagar, Bhopal (Madhya Pradesh)
Tel.: 0755-2589119, 5275848

Contact

Director

Central Institute of Agricultural Engineering, Bhopal-462038, Madhya Pradesh

Tel.: 0755-2737191 Fax: 0755-2734016

E-mail: director@ciae.res.in

Tractor Operated 6-Row Pneumatic Planter

Salient features

- Suitable for precision planting of single seed of crops like mustard, sorghum, soybean, cotton seed, pigeon pea, maize, groundnut and okra.
- | | |
|--------------------|-------------------------|
| Dimensions (l×w×h) | : 924×2400× 1,373 mm |
| Weight | : 320 kg |
| No. of rows | : 2-6 (adjustable) |
| Row spacing | : 250 mm or more |
| Seed metering | : pneumatic disc |



Performance

- Field capacity for planting of okra, cotton and groundnut: 0.31, 0.42 and 0.40 ha/h, respectively.

Cost

- Unit cost : ₹ 48,000
- Operating cost : ₹ 800-900/ha

Impact and benefits

- ₹ 1000/ha through saving of seed and cost of operation.
- Timeliness of operation.

Manufacturers

- M/s Lakshmi Industries
4 Industrial Area, Chhola Road, Bhopal 462038 (Madhya Pradesh)
- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Vinod Agriculture Industries
Khari Phatak, Mandi Gate, Vidisha Bhopal (Madhya Pradesh)
Tel.: 07592-235021
- M/s Yashodha Engineering
Shop No. 14, New Rajiv Nagar, Bhopal (Madhya Pradesh)
Tel.: 0755-2589119, 5275848

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Tractor Operated Seed-cum-Fertilizer Drill for Onion

Salient features

- It is useful to sow the onion seeds in rows and also to apply fertilizer.

Performance

- Field capacity : 0.4 ha/h

Cost

- Unit cost : ₹ 25,000
- Cost of operation : ₹ 800/ha

Impact and benefits

- Saving of labour up to 90%.
- Ease in adoption.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260
- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS, Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006



Contact

Director
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Hessaraghatta Lake P.O.,
Bengaluru-560089, Karnataka
Tel.: 080-28466420 Fax: 080-28466291
E-mail:director@iihr.ernet.in Website: www.iihr.ernet.in

Tractor Drawn Cultivator Tines Zero Till Seed-cum-Fertilizer Drill

Salient features

- Technology effective in establishment of subsequent wheat and rice crop. It is suitable for gram, peas, soybean and linseed, etc.
Weight : 350 kg

Performance

- Field capacity : 1 ha/h

Cost

- Unit cost : ₹ 30,000



Impact and benefits

- Saving in cost of operation.

Manufacturers

- M/s Bata Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur (Chhattisgarh)
Tel.: 0771-6065555 E-mail: bataaengg@gmail.com
- M/s Dandekar Fabricator, Near High school
Tamaseoni, Arang, Raipur (Chhattisgarh)
Tel.: 09754956717

Contact

Dean
College of Agricultural Engineering
Indira Gandhi Krishi Vishwavidyalaya, Raipur 492012 (Chhattisgarh)
Tel.: 0771-24425475 Fax: 0771-2442131

Pusa Aqua-Ferti-Seed Drill

Salient features

- The machine makes possible the application of aqueous fertilizer alongside the seed which helps in better germination and initial development of crop. It is suitable for sowing *rabi* crops like wheat, gram etc. Aqueous fertilizer can be applied @ 8,000-10,000 l/ha.

Power source : 34 kW or more

Weight : 225 kg



Performance

- Field capacity : 0.25 ha/h

Cost

- Unit cost : ₹ 90,000

Impact and benefits

- Germination can be increased up to 53%.
- Yield can be enhanced up to 35%.
- Uniform distribution of aqueous fertilizer leads to uniform germination.
- Efficient utilization of water and fertilizer.

Manufacturers

- Revolving Fund Scheme of the Division of Agricultural Engineering
Indian Agricultural Research Institute, Pusa, New Delhi.

Contact

Head

Division of Agricultural Engineering

Indian Agricultural Research Institute, New Delhi 110012

Tel.: 011-25842294

E-mail: head_engg@iari.res.in

Tractor Drawn Automatic Potato Planter

Salient features

- Dimension (l×w×h) : 2,650×1,170×1,020 mm
- Approximate weight : 425 kg
- Row to row spacing : 600 mm
- Plant to plant spacing : 100-300 mm
- Power requirement : 22-30 kW
- Labour requirement : Two person



Performance

- Field capacity : 4.5 ha/day

Cost

- Unit cost : ₹ 95,000

Impact and benefits

- It is a substitute of semi-automatic potato planter.
- Reduced labour requirement and timeliness of operation.

Manufacturers

- M/s Avtar Singh & Sons
Near Railway Crossing, Ahmedgarh, Sangrur 148 021 (Punjab)
- M/s Droli Agriculture Works
Majestic Road, Moga (Punjab)
- M/s Gurunanak Agriculture Implements
G.T. Road Bypass, Near Focal Point, Jalandhar 144004 (Punjab)
- M/s Kartar Engineering Works
G.T. Road Bypass, Near Pathankot Chowk, Jalandhar 144004 (Punjab)

Contact

Head
Central Potato Research Station
Post Bag No. 1, Model Town, Jalandhar 144003 Punjab
Tel.: 0181-2791474 Fax: 0181-2790863
E-mail: cprsjalandhar@gmail.com

Motor Operated Rotary Dibber and Vacuum Seeder

Salient features

- It is a rotary dibbler for protrays
- Consists of vacuum pump with vacuum chamber and seed tray for seeding.

Performance

- Capacity : 150 protrays/h

Cost

- Unit cost : ₹ 1,00,000
- Operational cost : ₹ 0.50/protray

Impact and benefits

- It increases efficiency of labour and seedling production.
- Labour and time saving.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West). Upparahalli Main Road
Tumkur 572 102 (Karnataka)
- M/s Dollar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya,
Bengaluru-560058 (Karnataka) Tel.: 080-28393000, 28395000
- M/s Institute of Himalayan Bioresource Technology (CSIR)
Post Box No. 6 Palampur (Himachal Pradesh)
- M/s National Research Centre for Cashew, Puttur (Karnataka)
- M/s National Research Centre for Citrus
Amravati Road, Nagpur (Maharashtra)
- M/s Sher-e-Kashmir University of Agricultural Sciences and Technology
Srinagar, Kashmir (Jammu and Kashmir)



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Bengaluru 560089 (Karnataka)
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E-mail: director@iihr.ernet.in Website: www.iihr.ernet.in

Media Filling, Levelling, Dibbling, Sowing and Watering Machine

Salient features

- It mixes the media and conveys it to the filling hopper.
- The media is levelled in the protrays and excess media falls back into the hopper.
- Protrays filled by tray filling machine are in the seed depression in each cell.
- Seeds are singulated by vacuum seeder and dropped in the depressions in cells
- It is suitable for 98 cells protray of 530×270 mm size.



Performance

- Field capacity : 200 pro trays/h
- Field efficiency : 70%

Cost

- Unit cost : ₹ 4,00,000
- Cost of operation : ₹ 0.50/ pro tray

Impact and benefits

- The nursery machinery increases labour efficiency and seedling production.
- Labour saving and time saving.

Manufacturers

- M/s Dollar Engg. Industries Pvt. Ltd.
#3, 1st 'A' Cross, 1st 'C' Main, 1st Stage, Peenya, Bangalore-560 058.
- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn.(West)
Upparahalli main Road, Tumkur-572 102 (Karnataka)

Contact

Director

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Bengaluru 560089 (Karnataka)

E.mail:director@iihr.ernet.in

Tel.: 080-28466420 Fax: 080-28466291

Website: www.iihr.ernet.in

Gender Friendly Rice Weeder

Salient features

- Weed cutting, uprooting and incorporation in soils is made by push pull action in rice.



Performance

- Soil cutting depth : 25-30 mm
- Field efficiency : 50-60%
- Weeding efficiency : 80-85%
- Working capacity : 0.088 to 0.12 ha/day/person

Cost

- Unit cost : ₹ 620

Impact and benefits

- Savings in cost of operation.

Manufacturers

- M/s Batala Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur (Chhattisgarh)
Tel.: 0771-6065555 E-mail: batalaengg@gmail.com
- M/s Dandekar Fabricator, Near High school
Tamaseoni, Arang, Raipur (Chhattisgarh)
Tel.: 09754956717

Contact

Dean Faculty of Agricultural Engineering
College of Agricultural Engineering
Indira Gandhi Krishi Vishwavidyalaya
Raipur 492006 (Chhattisgarh)
Tel.: 0771-2442575, 2102575

CIAE Bullock Drawn Sprayer

Salient features

- Bullock drawn machine suitable for chemical spraying on soybean, gram, pigeonpea, maize and other crops requiring high clearance.
- | | |
|-------------------|-------------------------|
| Dimensions(l×w×h) | : 3,900×1,800×1,850 mm |
| Boom length | : 2.1m |
| No of nozzles | : 6 |
| Type of nozzles | : Hollow cone No. 75450 |
| Tank capacity | : 200 l |



Performance

- Field capacity : 0.56 ha/h
- Cost of operation : ₹ 175/h

Cost

- Unit cost : ₹ 5,000
- Cost of operation : ₹ 175/h

Impact and benefits

- It is suitable for farmers growing cotton and other high clearance crops.
- Increases annual use of draught animals.

Manufacturers

- M/s Padsons Industries Pvt. Ltd.
H-28/2, Phase-III MIDC Mangaldas Market, Akola 444104 (Maharashtra)
Tel.: 0724-2258099
E-mail: padsons@gmail.com padgilwar@padsons.com
- Prototype Production Centre
Central Institute of Agricultural Engineering, Bhopal (Madhya Pradesh)

Contact

Director

Central Institute of Agricultural Engineering, Bhopal 462038 (Madhya Pradesh)

Tel.: 0755-2521001, 2737191 Fax: 0755-2734016

E-mail: director@ciae.res.in

Tractor Operated Rotary Weeder

Salient features

- The weeder encompasses three sets of rotary blade assemblies to cut weeds and incorporate them in soil. Row-to-row spacing can be varied from 675 to 1,165 mm.



Performance

- Field capacity : 0.3-0.8 ha/h
- Field efficiency : 70-80%
- Weeding efficiency : 61-82%
- Per cent plant damage : 1-3%

Cost

- Unit cost : ₹ 60,000
- Cost of operation : ₹ 1,200/h

Impact and benefits

- It saves 54% labour and 74% cost of operation as compared to traditional method.
- Reduces labour requirement and human drudgery.

Manufacturers

- Gurunanak Industries Sales Corp.
Near Tinkoni, Opp. BDO Office, Mansa 151505 (Punjab)
Tel.: 01652-232998
E-mail: gurureaper@gmail.com gurureaper@rediffmail.com

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Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road
Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2521163 Telefax: 0755-2733385
E-mail: fim@ciae.res.in

Tractor Operated Air Sleeve Boom Sprayer

Salient features

- Consists of spray boom covered with air sleeve. Air velocity improves the droplet size of the sprayer.
- Nozzle pressures : 2.8 and 4.2 kg/cm²



Performance

- Field capacity : 1.5-2 ha/h
- Field efficiency : 75-82%

Cost

- Unit cost : ₹ 2,80,000

Impact and benefits

- Results in higher yield of cotton over boom sprayer, aero blast sprayer and knapsack sprayer.
- Reduces labour requirement and drudgery.

Manufacturers

- M/s ASPEE Group of Companies
Aspee House, BJ Patel Road, Malad (West),
Mumbai 400064 (Maharashtra)
Tel: 022-28822331-35 E-mail: aspw@aspee.net
- M/s Gursukh Agro Works
Vill. Jhakroudi, P.O. Samrala, Ludhiana 141 114 (Punjab)
Tel.: 01628-262422 E-mail: ppsguron@rediffmail.com

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Tel.: 0755-2521163 Telefax: 0755-2733385
E-mail: fim@ciae.res.in, director@ciae.res.in

Tractor Operated Raised Bed Weeder

Salient features

- Raised bed weeder is suitable for chillies and other vegetable crops.

Performance

- Field capacity : 0.2 ha/h

Cost

- Unit cost : ₹ 25,000
- Cost of operation : ₹ 1,500/ha



Impact and benefits

- Increases efficiency of labour and saves about 70% of weeding time.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West). Upparahalli Main Road
Tumkur 572 102 (Karnataka)
- M/s Dollar Engg. Industries Pvt. Ltd.
#3, Adjacent to BS Tumkur Road, 1st Stage, Peenya,
Bengaluru-560058 (Karnataka) Tel.: 080-28393000, 28395000
- M/s Guru Nanak Agriculture Implements Mfrs
G.T. Road, Bye Pass Near Focal Point Jalandhar 144004 (Punjab)
Tel.: 0181-2602670, 2600040 Fax: 0181-2602670
E-mail: urunanakagri@vsnl.net
- M/s Kisan Engineering Works
C-57, M.I.D.C., Awadhan Road No.3, Dhule MIDC 424006 (Maharashtra)
Tel.: 02562-239812
- M/s National Agro Industries
Link Road, Industrial Area – A, Opp. Transportnagar
Ludhiana 141 003 (Punjab)
Tel.: 0161-2222041, 5087853 Fax: 0161-2220299
E-mail: nationalagro@satyam.net.in

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Indian Institute of Horticultural Research
Hessaraghatta Lake P.O., Bengaluru 560089 (Karnataka)
Tel.: 080-28466420 Fax: 080-28466291
E-mail: director@ihr.ernet.in Website: www.ihr.ernet.in

Manual Fruit Harvester

Salient features

- Tool to pick fruits from trees without damage. Nylon net is fixed to the metal ring to hold the plucked fruits.



Performance

- Capacity : 750 fruits/h

Cost

- Unit cost : ₹ 100

Impact and benefits

- A low cost gadget, useful for harvesting of mango without damage.

Manufacturers

- M/s Dolar Engineering Industries Pvt. Ltd.
#3, Adjacent to BIS, Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000
Fax: 080-28395006

Contact

Research Engineer
AICRP on Post Harvest Technology
University of Agricultural Sciences, GKVK, Bengaluru 560065 (Karnataka)
Tel.: 080-23330153 : Extn. 345, 346
Telefax: 080-23545640

Manual Mango Harvester

Salient features

- It is an improvement over conventional harvester. The fruit is held between the cushioned frame, pole and the blade. There is no sap bleeding and the shelf-life of the fruit is increased by 3-4 days. When 4-5 fruits are collected the net is emptied.



Performance

- Capacity : 95 kg/h

Cost

- Unit cost : ₹ 300



Impact and benefits

- Higher harvesting capacity and ease of operation. Reduction in fruit damage Compared to conventional method.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260

Contact

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Hessaraghatta Lake P.O., Bengaluru 560089 (Karnataka)
Tel.: 080-28466420 Fax: 080-28466291
E-mail: director@iihr.ernet.in Website: www.iihr.ernet.in

Manual Lime Harvester

Salient features

- Lime harvester is easy to push in the canopy, the harvested fruit is collected in the box, which is emptied after 8-10 fruits are collected.

Performance

- Capacity : 15-20 kg/h

Cost

- Unit cost : ₹ 300

Impact and benefits

- Lime harvester increases efficiency of labour and reduces harvesting time.



Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
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Manual Sapota and Guava Harvester

Salient features

The frame is fitted with cushioned pegs to hold the fruit and harvest only fruits of required size, leaving immature fruits on the tree

Performance

- Capacity : 50-100 kg/h

Cost

- Unit cost : ₹ 300

Impact and benefits

- Man power and time saving. Reduces fruit damage.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
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Manual Cassava Harvester

Salient features

- A manually operated device to dig out cassava tubers. The device has a mechanical advantage of 3.4 and total weight of 8 kg.



Cost

- Unit cost : ₹ 975

Impact and benefits

- Saving of about ₹ 200 per ha in lieu of manual harvesting.

Manufacturers

- M/s Kamshet Agro Industries Pvt Ltd.
Pune (Maharashtra)
- M/s Mitraniketan
Vallanad
- Krishi Vigyan Kendra Narakkal Ernakulam and Allepey

Contact

Division of Crop Utilization
Central Plantation Crops Research Institute
Kasaragod 671124 (Kerala)
Website: www.cpcri.gov.in

Self-Propelled Vertical Conveyor Reaper

Salient features

- The self-propelled vertical conveyor reaper cuts and conveys the crop to one side for collection of the crop later. Operator walks behind the implement and guide. The cutter bar of the equipment is powered through a small diesel engine.



Dimensions (l×w×h) : 2,450×1,200×1,000 mm

Weight : 245 kg

Power source : 4.5 kW diesel engine

Performance

- Field capacity : 0.2-0.25 ha/h
- Field efficiency : 65-70 %
- Fuel consumption : 0.75-0.8 l/h
- Total losses : 1.0-1.5% (Paddy), 3.0-4.0% (Soybean)

Cost

- Unit cost : ₹ 1,00,000
- Cost of operation : ₹ 1,000/ha

Impact and benefits

- Saves 131 man-h/ha with the use of self-propelled reaper for harvesting of crop, i.e. almost 75% less man-power, as compared to traditional method.
- 40% saving in cost of operation

Manufacturers

- M/s BCS India Pvt. Limited
Vill. Manngarh, Kohara –Machchiwara Road, P.O. Kohara,
Ludhiana 141112 (Punjab) Te.: 0161-3238598
- M/s Swathi Industries,
Marudhanmalai Road, New Thillai Nagar, PN Purdur,
Coimbatore 641004 (Tamil Nadu)
- M/s Gurunanak Industries Sales Corp.
Near Tinkoni, Opp. BDO Office, Mansa 151505 (Punjab)
Tel.: 01652-232998
E-mail: gurureaper@gmail.com, gurureaper@rediffmail.com
- M/s Field Worthy Equipment Private Limited
Patel Farm, Bhamariya Kua Bus Stand, NH 8 Lambha,
Ahmedabad 382405 (Gujarat) Tel.: 079-25716031

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Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)

Tel.: 0755-2521001, 2737191 Fax: 0755-2734016 E-mail: director@ciae.res.in

Tractor Operated Turmeric Digger

Salient features

- Suitable for harvesting turmeric and ginger with less damages to rhizomes.

Performance

- Field capacity : 0.4 ha/day
- Digging efficiency : 93.5%



Impact and benefits

- Reduction in manpower requirement.

Manufacturer

- M/S Samad Engg Works
Parbhani. (Maharashtra)

Contact

Head

Department of Farm Machinery and Power

College of Agricultural Engineering

Marathwada Krishi Vidyapeeth, Parbhani 431402 (Maharashtra)

Website: www.mkv.ac.in

Tractor Drawn Hydraulic Platform for Harvesting, Pruning and Spraying

Salient features

- Tractor drawn hydraulically operated platform has a reach height of 4 m. A four wheeled fruit collecting net is provided to collect the harvested fruits with minimum physical damage. Harvesting platform also has attachment for pruning of trees and spraying on trees.

Performance

- Harvesting : 500 kg/h
- Pruning : 1 tree/h
- Spraying : 4 trees/h

Impact and benefits

- It increases working capacity. It also enhances efficiency of manpower.
- Reduces fruit damage.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
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E-mail: director@iihr.ernet.in Website: www.iihr.ernet.in

Self-propelled Hydraulic Multi-purpose System

Salient features

- Self-propelled hydraulically operated elevator system facilitates orchard operations like harvesting, pruning and spraying. It can be rotated 360° and has hand controls on the operator platform.

| | |
|----------------------|---------------------------|
| Power | : 2.7 kW petrol engine |
| Dimension(l×w×h) | : 6,320×2,200×1,890 mm |
| Ground clearance | : 270 mm |
| Maximum ground speed | : 3 km/h |



Performance

- Capacity : 700 mangoes/h (Approx. 140 kg/h)

Cost

- Unit cost : ₹ 7,00,000

Impact and benefits

- Better quality fruits with less damage resulting in higher returns.
- Effective pruning and spraying owing to better access to canopy.

Manufacturer

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119

Contact

Director
Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road
Bhopal 462038 (Madhya Pradesh)
Tel.: 07552521001
E-mail: director@ciae.res.in

Women Friendly Sugarcane Detrasher

Salient features

- It consists of two curved knives welded to two ends of U-shaped stem, which is attached to a metal pipe. Gap between two knives can be adjusted.

Dimension (l×w×h) : 475×56×
70 mm

Weight : 0.40 kg



Performance

- Stripping capacity : 1,125 kg cane/day

Cost

- Unit cost : ₹ 650
- Cost of operation : ₹ 5,800 /ha

Impact and benefits

- As compared to conventional hand dethrashing, 13.0 per cent and 14.5 per cent saving in cost and time respectively.
- Significant reduction in physiological stress and discomfort.
- Eliminating dermatological injury.

Manufacturer

- M/s KSNM Marketing
SF No. 29/1B, Ona Palayam Siruvani Water Lind Road,
Dheenam Palayam Post, Coimbatore 641109 (Tamil Nadu)
Tel.: 0422-3251175, E-mail: ksnm@hotmail.com

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Tel.: 0755-2747430 Fax: 0755-2743016
E-mail: director@ciae.res.in Website: www.ciae.res.in

Tractor Operated Straw Reaper-cum-Trailer

Salient features

- It harvests straw of combine harvested wheat field, gathers shattered ear heads from uncut plants, threshes straw into fine quality *bhusa* and separates collected grains. Simultaneously it blows *bhusa* (fine straw) in the in-built overhead trailer. Thus the work of harvesting, threshing, loading and unloading is done with only one tractor.

| | |
|----------------------|-----------------|
| Power source | : 22 kW tractor |
| Length of cutter bar | : 1,830 mm |
| Height of cut | : 60 mm |



Performance

- Field capacity : 0.40 ha/h
- Straw output : 130 kg/h

Cost

- Unit cost : ₹ 3,00,000
- Cost of operation : ₹ 1,500-1,600/ha

Impact and benefits

- Lower turning radius of 4 m facilitates better maneuverability. Easy in loading and unloading of the straw with lesser fatigue to operator.

Manufacturers

- M/s Rattan Agro Industries, C-68-70 Focal Point, G.T. Road
Moga 142001 (Punjab)
Tel.: 01636-228511; 231208
E-mail: rattan_c69@yahoo.co.in

Contact

Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal-462 038 (Madhya Pradesh)
Tel.: 07552521001
E-mail: director@ciae.res.in

Tractor Operated Straw Combine

Salient features

- It consists of stubble cutting and collection unit, feeding unit, straw bruising unit and 'bhusa' blowing unit. Straw combine recovers wheat straw after combine operation. Straw is cut and collected in the trailer. Additional grain recovery of 50-100 kg/ha.
Power : 34 kW tractor
Width of cut : 1,900 mm



Performance

- Field capacity : 0.4-0.6 ha/h

Cost

- Unit cost : ₹ 2,50,000
Cost of operation : ₹ 800/ha

Impact and benefits

- Saves *bhusa* and recovers grain.

Manufacturers

- M/s Dashmesh Mechanical Works
Raikot Road, Malerkotla Amargarh Distt. Sangrur 148023 (Punjab)
Tel.: 01675-284221 E-mail: info@dasmesh.net
- M/s Bharat Industrial Corporation
Akalsar Road, Moga 142001 (Punjab)
Tel.: 01636-224075 E-mail: baldev_moga@satyam.net.in
- M/s Gurudev Mechanical Works
New Bus Stand, Zira Faridkot Road, Talwandi Bhai, Firozpur (Punjab)
Tel.: 01632-230130
- M/s Jhandena Industries
C-70, Focal Point, GT Road, Moga 142001 (Punjab)
Tel.: 01636-228511
E-mail: jhandeanac_70@yahoo.co.in, rattan_c69@yahoo.co.in
- M/s Kartar Agro Industries Pvt. Ltd
Amlah Road, Bhadson, Patiala 147202 (Punjab)
Tel.: 01765-260136 Fax: 01765-260486
E-mail: kartarcombine@kartarindia.com, kartar1234@rediffmail.com
- M/s Malwa Agri Works
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Groundnut Stripping Frame

Salient features

- One to four persons can work simultaneously to strip groundnut pods from vines. An iron frame is mounted with triangular wireloop to detach groundnut pods from vines. Convenient to work in sitting posture.



Performance

- Stripping capacity : 15-20 kg/h

Cost

- Unit cost : ₹ 700

Impact and benefits

- Increase in efficiency 30%

Manufacturers

- M/s Samad Engg Works
Parbhani (Maharashtra)

Contact

Head
Department of Farm Machinery and Power
College of Agricultural Engineering
Marathwada Krishi Vidyapeeth, Parbhani 431402 (Maharashtra)
Website: www.mkv.ac.in

Women Friendly Pedal Operated Rice Thresher

Salient features

- The thresher is provided with wire loops and it separates grains from panicles.

Dimension (l×w×h) : 880×750×
980 mm

Weight : 42 kg

Drum width : 460 mm



Performance

- Capacity : 45 kg(grain)/h

Cost

- Cost : ₹ 5,500
- Cost of operation : ₹ 22/h

Impact and benefits

- Improved operator's posture reduces significantly physiological stress and discomfort.
- 50% saving in labour
- Women friendly technology
- Avoids bending posture and reduces drudgery.

Manufacturers

- M/s Unicus Engineering Pvt Ltd.
23, Madhusudan Nagar, Bhubaneswar 751001 (Odisha)
Tel.: 0674-6554135, 3291391
E-mail: unicus.eng@gmail.com
- M/s Sidheswar Engineering Works
Bidhyadharpur, Cuttack 753004 (Odisha)

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E-mail: director@ciae.res.in

VL Rice Thresher

Salient features

- A wireloop thresher operated manually by one person. Provision for pedaling in sitting posture.

Dimension (l×b×h) : 1,030×630×975 mm

Weight of the machine : 35 kg

Threshing speed : 350 rpm



Performance

- Capacity : 80-100 kg/h
- Threshing efficiency : 98%

Cost

- Unit cost : ₹ 3,800

Impact and benefits

- Reduces drudgery and improves labour productivity.

Manufacturers

- M/s Punjab Agricultural Implements (P) Ltd.
Saharanpur (Uttar Pradesh)

Contact

Director

Vivekanand Parvatiya Krishi Anusandhan Sansthan

Almora 263601 (Uttarakhand)

Tel.: 05962-230208 E-mail: vpkas@nic.in

Website: www.vpkas.nic.in

Manual Double Drum Rice Thresher

Salient features

- A wireloop thresher operated manually by two persons. Two threshing drums are mounted on a single shaft where two persons can pedal the machine simultaneously.

Threshing cylinder speed : 325 rev/min

Weight : 110 kg



Performance

- Capacity : 70-90 kg/h

Cost

- Unit cost : ₹ 12,500

Impact and benefits

- Saving in cost of operation.

Manufacturers

- M/s Asian Trading Company, Station Road
Raipur (Chhattisgarh)
Tel.: 098261-55595; 094255-01352 E-mail: replayatco@yahoo.co.in
- M/s Batala Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur (Chhattisgarh)
Tel.: 0771-6065555 E-mail: batalaengg@gmail.com
- M/s KD Enterprises
Raipura, Raipur (Chhattisgarh)

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Tel.: 0771-2442575, 0771-2102575
Website: www.igau.edu.in

High Capacity Multi-crop Thresher

Salient features

- It is suitable for threshing wheat, maize, sorghum, pigeonpea, soybean and sunflower.
- It can be operated by a 15 kW electric motor or 27 kW tractor PTO.

| | |
|----------------|-------------------|
| Cylinder speed | : 200-750 rev/min |
| Blower speed | : 800-900 rev/min |
| Weight | : 1,200 kg |



Performance results

- Output (kg/h)

| | |
|-----------|---------|
| Wheat | : 1,450 |
| Soybean | : 800 |
| Maize | : 2,900 |
| Pigeonpea | : 950 |
| Sorghum | : 1,150 |
| Gram | : 1,350 |
| Sunflower | : 550 |
| Mustard | : 425 |
- Threshing efficiency : 99.3 -99.8%
- Cleaning efficiency : 96.5 -99.9%
- Broken grain : 0.5 -1.4%
- Total loss : 0.85 -3.00%

Cost

- Unit cost : ₹ 80,000
- Operating cost : ₹ 500/h
- Operating cost : ₹ 400/tonne

Impact and benefits

- It facilitates timely threshing of the crop to achieve better quality and higher yield of the crop.
- Reduces drudgery and threshing accidents because of safe design of feeding chute and other parts.

Manufacturers

- M/s Laxmi Steel Fabs
Nishatpura, Berasia Road, Bhopal 462008 (Madhya Pradesh)
Tel.: 0755-4251793, 2743375
- M/s Ganga Industries
Krishi Upaj Mandi AB Road, Dewas (Madhya Pradesh)
Tel.: 07272-255620
- M/s Sona Engineering Works
Englishpura, Sehore (Madhya Pradesh)
Tel.: 07562-224067
- M/s Amar Agri Implement Works
Amar Street, Janta Nagar, Gill Road, Ludhiana 141003 (Punjab)
Tel.: 0161-2491780, 2493128
E-mail: amaragri@satyam.net.in
- M/s Amar Singh and Sons
Near Railway Crossing Ahmedgarh 148021 (Punjab)
Tel.: 01675-240479
- M/s Avtar Singh and Sons
Near Railway Crossing, Ahmedgarh 148021 (Punjab)
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E-mail: director@ciae.res.in

Whole Maize Crop Thresher

Salient features

- Suitable for threshing whole maize crop. Power requirement of the equipment is 5.5 kW motor.

Performance

- Output : 210 kg/h
- Threshing efficiency : 100%
- Cleaning efficiency : 98.6%



Cost

- Unit cost : ₹ 55,000
- Operating cost : ₹ 250-350/tonne

Impact and benefits

- Reduces manpower requirement during peak season and human drudgery.

Manufacturers

- M/s Kanhaiyalal Ramratan Krishi Yantra Laghu Udyog
Bus Stand, Rampura Dabadi, Sikar Road, Jaipur (Rajasthan)
Tel.: 098291-95072

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High Capacity Multi crop Thresher

Salient features

- It is suitable for threshing wheat, maize, sorghum, pigeonpea, soybean and sunflower. It can be operated by a 15 kW electric motor or 27 kW tractor PTO.



Performance

- Output Capacity
 - Wheat : 1,600-2,000 kg/h
 - Raya* : 800-1,000 kg/h
 - Gram : 600-800 kg/h
 - Green Stetram : 400-500 kg/h
 - Threshing efficiency : 98-99%

Cost

- Unit cost : ₹ 1,00,000- 3,00,000
- Cost of operation : ₹ 250-300/h

Impact and benefits

- Reduces labour and human drudgery.

Manufacturers

- M/s Ganga Industries
AB Road, Dewas (Madhya Pradesh)
- M/s Amar Agri Implement Works
Amar Street, Janta Nagar, Gill Road, Ludhiana 141003 (Punjab)
Tel.: 0161-2491780 E-mail: amaragri@satyam.net.in
- M/s Amar Singh and Sons
Near Railway Crossing, Ahmedgarh 148021 Sangrur (Punjab)
Tel.: 01675-240479
- M/s Avtar Singh & Sons
Near Railway Crossing, Ahmedgarh 148021 Sangrur (Punjab)
Tel.: 01675-240479
- M/s Bharat Industrial Corporation
Akalsar Road, Moga 142001 (Punjab)
- M/s Dasmesh Mechanical works
Nabha-Malerkotla Road, Amargarh, Dist. Sangrur 148022 (Punjab)
Tel.: 01675-284221 E-mail: info@dasmesh.net

- M/s Droli Mechanical Works
Near Majestic Cinema, Majestic Road, Moga 142001 (Punjab)
Tel.: 01636-223487
- M/s Jandu Agro Industries
B-36, Focal Point, Moga 142001 (Punjab)
Tel.: 01636-221955, 224434
- M/s Madho Engg. Works
B-3, Focal Point, Moga 142001 (Punjab)
Tel.: 01636-222709, 227045
- M/s Malkit Engg Works
Railway Crossing, Talwandi Bhai Ferozpur (Punjab)
Tel.: 01632-230422
- M/s Parambeer Engineers and Manufactures
C-71 & 72 Focal Point, Moga 142001 (Punjab)
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- M/s Sirsa Industries
D-16 Focal Point, Moga 142001 (Punjab)

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Power Operated Winnower

Salient features

- For cleaning of foodgrains and grading of groundnut on the basis of difference in densities.
- Power source : 750 W motor

Performance

- Capacity : 300-600 kg/h

Cost

- Unit cost : ₹ 15,000



Impact and benefits

- On-farm value addition technology for foodgrains.
- Improves quality of produce.
- Saves money and time.

Manufacturer

- Division of Agricultural Engineering
Indian Agricultural Research Institute, Pusa, New Delhi 110012
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Portable Winnower

Salient features

- Useful for winnowing of agricultural produce after threshing.

Performance

- Capacity : 500 kg/h

Cost

- Unit cost : ₹ 14,000

Impact and benefits

- It reduces cost of operation.

Manufacturer

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road,
1st Stage, Peenya
Bengaluru 560058 (Karnataka)
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CRR I Power Operated Paddy Winnower-cum-Cleaner

Salient features

- Dimensions (l×b×h) : 1,120×720×1,320 mm
- Power requirement : 750 W

Performance

- Capacity : 500 kg/h (clean grains)
- Manpower requirement : 2 nos.
- Cleaning efficiency : 99%

Cost

- Unit cost : ₹ 14,000
- Cost of operation : ₹ 60/100 kg (machine)

Impact and benefits

- Reduces drudgery in cleaning operation.

Manufacturer

- Development Engineer Farm Machinery Research and Development Centre (OF MRDC) Satyanagar Bhubaneswar 751007 (Odisha)
Tel.: 0674-2572710, 0674-2571860
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Tel.: 0671-2367757 Fax. 0671-2367663
E-mail: directorcrrri@sify.com, crrictc@nic.in
www.crrri.nic.in

Turmeric Washing and Polishing Machine

Salient features

- It can wash and polish turmeric rhizomes by replacing the sieves with an abrasive surface.
- | | |
|--------------|------------------------|
| Dimension | : 860 × 760 × 1,140 mm |
| Weight | : 200 kg |
| Power Source | : 750 W motor |



Performance

- Capacity washer : 250-350 kg/h
- Capacity polisher : 100 kg/h
- Washing efficiency : 91%

Cost

- Cost : ₹ 80,000-1,20,000
- Cost of washing : ₹ 7/100 kg
- Cost of polishing : ₹ 8/100 kg

Impact and benefits

- Cleans and polishes the rhizomes to fetch higher price.
- Reduces drudgery and maintains hygienic processing.

Manufacturer

- Paradise Engg. Corp.
392, Industrial Area-A, Ludhiana 141003 (Punjab)
Tel.: 0161-2228055
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Tel.: 0161-2401960 (Ext 384) E-mail: msalam_6@yahoo.com

Single Drum Rotary Screen Grain Pre-cleaner

Salient features

- Consists of replaceable perforated rotary screen, a blower and a perforated vibratory discharge chute.
- Dimension (l×b×h) : 1,525×1,115×1,730 mm
- Weight : 100 kg
- Power source : 1.2 kW



Performance

- Output capacity : 1,200 – 1,500 kg/h
- Efficiency : 95%

Cost

- Unit cost : ₹ 70,000
- Cost of operation : ₹ 25/100 kg

Impact and benefits

- Cleaning of grain prior to marketing fetches higher returns.
- Drudgery reduction – Increased profit.

Manufacturer

- M/s Hindsons Pvt Ltd.
The Lower Mall, Patiala 147001 (Punjab)
Tel.: 0175-2213710

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Cotton Pre-cleaner

Salient features

- Draws the seed cotton inside and agitates across the grid surfaces and conveys seed cotton across the cleaning surface containing small openings or slots underneath each cylinder.
- Separated trash falls through the grids into the trash chamber.
- Number of cylinders : 4-6
- Width : 1,200-1,800 mm
- Power requirement : 2.98-5.59 kW



CIRCOT-BAJAJ Inclined Pre-cleaner



CIRCOT-BAJAJ Horizontal Pre-cleaner

Performance

- Capacity : 3,500-6,000 kg/h
- Cleaning efficiency : 40-50%

Cost

- Unit cost : ₹ 2,50,000

Impact and benefits

- Useful for pre-cleaning of cotton.

Manufacturer

- M/s Bajaj Steel Industries Ltd.
Imamabada Road, Nagpur 440018 (Maharashtra)
Tel.: 0712-2720071- 80 (Fax : 0712 - 2728050 / 2723068)
Mobile: 09325132305, 9860093038 (Product Enquiry)

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Email: circot@vsnl.com

Pedal-cum-Power Operated Cleaner

Salient features

- Power-cum-pedal operated.
- Removes dust, dirt, straw, chaff etc. and grades the cereals and pulses.
- Power source : 370 W

Performance

- Capacity : 330-800 kg/h

Cost

- Unit cost : ₹ 20,000

Impact and benefits

- Reduces drudgery and increases capacity.

Manufacturers

- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683
- M/s Yashoda Engineering
Laghu Udyog, Shed No. 12, Sector – I
Industrial Estate, Govindpura, Bhopal 462023 (Madhya Pradesh)
- M/s Vinod Enterprises
104, Sector – I, Industrial Estate
Govindpura, Bhopal 462023 (Madhya Pradesh)
- M/s Venkatesh Agro Engineering Works
C-30, Additional MIDC, Jalna 431203 (Maharashtra)
Tel.: 02482-220049
- M/s Ajay Industries
Plot no. C-3 MIDC Area, Amaravati 444605 (Maharashtra)
Tel.: 0721-2520305, 0721-2521485
- M/s Captain Tractors Pvt. Ltd.
106, Royal Complex, Dhebar Road Dist. - Rajkot 360002 (Gujarat)
Tel.: 0281-2228216 E-mail: info@captaintractors.com



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Pedal-cum-Power Operated Double Screen Cleaner-Grader

Salient features

- It separates dust, dirt, stones, straw, chaff etc. and grade the cereals and pulses.



Performance

- Capacity (power operated) : 900 kg/h
- Pedal operated : 600 kg/h
- Dimensions (l×b×h) : 1,600×500×1,000 mm
- Weight : 100-110 kg
- Manpower requirement : 0.4 man-h/100 kg

Cost

- Unit cost : ₹ 20,000
- Operating cost : ₹ 7.5/100 kg

Impact and benefits

- Improved capacity.
- Reduces drudgery.
- Increased profit.

Manufacturers

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Shri Manak Industries
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Spices Cleaner-cum-Grader

Salient features

- Grading is done on the basis of size and aerodynamic properties.
- It is suitable for cumin, fennel, dil-seed etc.
- Power: 750 W motor

Performance

- Efficiency : 75-80 %
- Capacity : 50 kg/h

Cost

- Unit cost : ₹ 30,000
- Operating cost : ₹ 37.50/ h
- Output : 0.75/ kg

Impact and benefits

- It saves labour and time.

Manufacturers

- M/s Vishvakarma Iron Works
Near Public Garden, Una 362560 Dist. Junagadh (Gujarat)
- M/s Annpurna Iron Works
Bhavnagar Road, Una 362560 Dist. Junagadh (Gujarat)
- R. K. Agro Industries,
GIDC-1 Plot No. C-2/89 Near Perfect Motors Rajkot Road
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Tel.: 0285-2661493
- A-one Agro Engg.
GIDC-2, Creative Casting Street, Daulatpura, Junagadh 362001(Gujarat)
Tel.: 09727416549
- Tulsi Agro Food Industries, S.R. No. 275/1 Paiki Plot No.14,
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Grain Cleaner : Manual or Motorized)

Salient features

- The top screen retains the impurities and the lower screen cleans the finer particles.

Performance

- Capacity: 100-120 kg/h

Cost

- Manual : ₹ 15,000
- Motorized : ₹ 30,000

Impact and benefits

- It increases cleaning efficiency and reduces time required for cleaning.
- It saves on labour.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
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Upparahalli Main Road, Tumkur 572 102 (Karnataka)
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Fruit and Vegetable Washing Machine

Salient features

- Pressurized sprays of water with a water injection pump through the central; perforated inner shaft is provided for extensive washing.
- Provided with a timer and an electronic device to regulate the rotational speed of the drum.
- Suitable for carrot, potato, radish, turnip, ginger, okra, tomato, spinach, turnip, kinnow and pears.

Dimension (l×b×h) : 860×760×1,140 mm

Weight : 200 kg

Power source : 750 kW motor



Performance

- Output capacity : 100-600 kg/h
- Efficiency : 90.2-95.5%

Cost

- Unit cost : ₹ 80,000-1,20,000
- Cost of operation : ₹ 2-15 /kg

Impact and benefits

- A wide range of fruits and vegetables can be washed.
- Value addition and increased income.
- Reduces drudgery, maintains hygiene.

Manufacturer

- Paradise Engg. Corp., 392, Industrial Area-A, Ludhiana 141003, (Punjab)
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Fruit Grader

Salient features

- The roller type fruit grader has four pairs of rollers with adjustable diverging gap between each pair of rollers.
- It is useful for grading spherical fruits into 3 to 4 grades.
- Dimension (l×b×h) : 2,300×1,500×1,500 mm
- Weight : 365 kg
- Power source : 750 W motor



Performance

- Capacity : 8-10 tonnes/day
- Efficiency : 70-85%

Cost

- Unit cost : ₹ 71,750
- Initial investment : ₹ 4,50,000
- Operating cost : ₹ 125/h, ₹ 125/tonne

Impact and benefits

- Minimizes fruit handling with improved capacity of grading 1.5 times over system.
- Fetches higher price for commodity, thereby increasing profit.

Manufacturers

- Maa Durga Plastic Products
J- 19, Phase III, MIDC, Akola 444104 (Maharashtra)
Tel.: 0724 – 2258523 / 2258529
- R.K. Industries
D-39, Phase II, MIDC, Akola 444104 (Maharashtra)
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E-mail: phtsakola@gmail.com

Fruit and Vegetable Grader

Salient features

- Grading on the basis of size and shape, suitable for sapota, lemon, onion, Potato etc.
- Power : 750 W motor
- Manpower : 2 nos.



Performance

- Efficiency : 80-90%
- Capacity : 400 kg/h

Cost

- Unit cost : ₹ 25,000
- Cost of operation : ₹ 3.60/100 kg

Impact and benefits

- Labour and time saving.
- Higher value to graded fruits and vegetables.
- Higher returns to farmer.

Manufacturers

- R. K. Agro Industries,
GIDC-1 Plot No. C-2/89 Near Perfect Motors Rajkot Road
Daulatpura, Junagadh 362001 (Gujarat)
Tel.: 0285-2661493
- A-one Agro Engg.
GIDC-2, Creative Casting Street, Daulatpura, Junagadh 362001 (Gujarat)
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Junagadh 362001 Gujarat
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Raw Mango Grader

Salient features

- Mangoes are made to roll under gravity from the feeding end of the grader in the expanding opening channel.
- Three grades 50-57; 57-64; 64-70 mm are obtained.

Performance

- Capacity : 2 tonnes/h

Cost

- Unit cost : ₹ 20,000



Impact and benefits

- The manual operation is time consuming and tedious, hence machine will increase the efficiency of the labour and reduce the time for grading.
- Labour and time saving.
- Reduces fruit damage.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
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Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
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Maize Dehusker Sheller

Salient features

- The machine carries out simultaneous dehusking and shelling of maize cobs in single pass.
- Concave below the cylinder separates kernels, hearts, and sheath falls on the opposite side.

Performance

- Dimension (l×b×h) : 2,150×1,140×1,650 mm
- Weight : 300 kg
- Power source : 3.7 kW motor
- Efficiency dehusking : 99%
- Efficiency shelling : 97-98%
- Capacity : 800 kg/h



Cost

- Unit cost : ₹ 63,000
- Operating cost : ₹ 150/100 kg

Impact and benefits

- Saves in cost of operation and time.

Manufacturers

- G.N. Enterprises
23 A, Govt. Press Road, Kisanpole, Udaipur 313001 (Rajasthan)
- M/s Kalpana Enterprises
N.D. Complex, Pratap Nagar Police Station, Udaipur-313 001

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Udaipur 313001 (Rajasthan) Tel.: 0294-2470102, Fax: 0294- 2471056
E-mail: nkjain64@gmail.com

Groundnut Decorticator for Women

Salient features

- It separates kernels from groundnut pods, designed for rural women who prefer sitting posture.
- Dimensions (l×b×h) : 500×270×600 mm
- Weight : 5.7 kg
- Manpower requirement : 2.5 man-h/q

Performance

- Manpower : 1 no.
- Output capacity : 35-40 kg/h

Cost

- Unit cost : ₹ 2,400
- Operating cost : ₹ 24/100 kg

Impact and benefits

- Capacity enhancement.

Manufacturers

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
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- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
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Groundnut/Sunflower Decorticator with Feeder and Separator

Salient features

- It is manually operated and breaks the groundnut pods which are later separated to shell and kernel.
- It can be used for sunflower decortications by changing sieve and shoe.
- Dimensions (l×b×h) : 500×250×1,100 mm
- Weight : 15 kg
- Manpower requirement : 1.6 man-h/100 kg



Performance

- Man power : One no.
- Output capacity : 60-65 kg/h
- Shelling efficiency : 93-98 %

Cost

- Unit cost : ₹ 2,500
- Operating cost : ₹ 21/100 kg

Impact and benefits

- Capacity enhancement over traditional hand/manual decortications.
- Reduces drudgery.

Manufacturers

- M/s Fine Fabrication Works
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Pedal Operated Maize Dehusker Sheller

Salient features

- Pedal operated maize dehusker sheller performs both dehusking and shelling in single operation.
- It requires one person to perform pedalling and another to feed the hopper.
- Dimensions (l×b×h) : 1,320×1,400×1,410 mm
- Weight : 170 kg
- Manpower : 2 nos.



Performance

- Shelling capacity : 130 kg /h

Cost

- Cost : ₹ 25,000
- Operating cost : ₹ 65/h and ₹ 50/q

Impact and benefits

- Lower cost of operation and reduced drudgery.
- Useful for small and marginal farmers including tribal farmers.

Manufacturers

- M/s M M Engineering Works
Plot No. G1- 469B, Road No. 12, Near UCCI office, M I A.
Udaipur 313003 (Rajasthan)
- M/s Bharat Engineering Works
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Mahua Seed Decorticator

Salient features

- *Mahua* seeds are decorticated by compression and shearing action between the wooden bars and zigzag square bars.
- Power : 750 kW
- Manpower : 1 no.

Performance

- Capacity : 100 kg /h
- Efficiency : 85%

Cost

- Unit cost : ₹ 30,000
(power operated)
- Operating cost : ₹ 10/100 kg

Impact and benefits

- Savings in the time and labour.
- Reduces drudgery.
- Beneficial to tribal woman.

Manufacturer

- M/s Akriti, At/PO Near Jharsuguda, Sambalpur 768221
Bamra Sambalpur 751003 (Odisha) Tel: 06642-229336



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Chilli Seed Extractor

Salient features

- Chilli seed extractor consists of drum with flat pegs enclosed in a casing and when rotated breaks all the chilli fruits by impact.
- The screen separates the seed from chilli husk.
- Dimensions (l×b×h) : 2,440×1,420×1,780 mm

Performance

- Capacity : 100-125 kg/h dry red chilli fruits
- Seed recovery : 94 - 98 %



Cost

- Unit cost : ₹ 62,125
- Initial investment : ₹ 1,12,500
- Operating cost : ₹ 75/h and ₹ 75/q

Impact and benefits

- Capacity of seed extraction is 2-3 times more than the conventional system.
- Minimizes sneezing and body irritation.
- Reduction in drudgery and air pollution.
- By-product utilization is possible for chilli powder industry.

Manufacturers

- Maa Durga Plastic Products
J- 19, Phase III, MIDC, Akola 444104 (Maharashtra)
Tel.: 0724-2258523, 0724-2258529
- Shri. Ram Associates
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Onion Seed Extractor

Salient features

- Pusa onion seed extractor is useful for extraction of good quality seed from onion umbel.
- Power source : 750 W motor

Performance

- Throughput : 25 kg/h (umbel)

Cost

- Unit cost : ₹ 22,000



Impact and benefits

- Saves extraction cost and reduces drudgery.
- Suited to small and marginal farmers.

Manufacturer

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Website: www.iari.res.in

Motorized Vegetable Seed Extractor

Salient features

- Power : 1.5 kW
- Weight : 125 kg

Performance

- Capacity Brinjal : 500 kg/h
- Ash/bottle gourd : 200 no.

Cost

- Unit cost : ₹ 15,000



Impact and benefits

- Suitable for small and marginal farmers.
- Useful for efficient extraction of seeds of tomato, brinjal, bottle gourd.

Manufacturers

- Division of Agricultural Engineering
Indian Agricultural Research Institute, Pusa, New Delhi 110012

Contact

Director

Indian Agricultural Research Institute

Pusa New Delhi 110012

Tel.: 011-25843375, 25842367 Fax: 011-25846420

E-mail: director@iari.res.in

Website: www.iari.res.in

Garlic Bulb Breaker

Salient features

- The garlic bulb breaker consists of two rubber rollers rotating in opposite direction.
- Bulbs, cloves, centre stem, root portion and wrappers get separated due to shearing action.



Performance

- Capacity : 50 kg/h
- Efficiency : 95%

Cost

- Unit cost : ₹ 25,000

Impact and benefits

- Increases efficiency of labour, reduces time required.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260
- Best Engineering Technologies
162, Prashanth Nagar, E.Kukatpally, Hyderabad 500072 (Andhra Pradesh)
Tel.: 040-65908498 Mobile: 09391057812
E-mail: bestengineering@gmail.com

Contact

Director

Indian Institute of Horticultural Research, Hessaraghatta Lake P.O.

Bengaluru 560089 (Karnataka)

Tel.: 080-28466420 Fax: 080-28466291

E-mail: director@iihr.ernet.in

Website: www.iihr.ernet.in

Pomegranate Aril Extractor

Salient features

- Processes whole Pomegranate for recovery of clean, whole and undamaged arils.
- Dimensions(l×b×h) : 1,480×660×1,710 mm
- Manpower : 2-3 nos.
- Power : 0.75kW(motor)

Performance

- Capacity : 500 kg/h
- Aril extraction/ separation efficiency : 90-94%
- Mechanical damage : 2-4%

Cost

- Unit cost : ₹ 4,00,000

Impact and benefits

- Fruits can be processed resulting in reduced post harvest losses and raw material for manufacturing value added products.

Manufacturers

- M/s Padmatech Engineering Systems
Plot No.219, Sector No. 10 PCN TDA, Bhosari,
Pune 411026 (Maharashtra)
Tel.: 07798882629 Email-padmatechengg@yahoo.com



Contact

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Tel.: +91-161-2313135, 124 Fax: +91-161-2308670

E-mail: ciphethicar@gmail.com Website: www.cipheth.in

Banana Comb Cutter

Salient features

- Used for separating banana comb/hand from banana bunch.
- Suitable for all sizes of banana bunch stem.

Performance

- It saves 5 to 8 banana fingers per bunch cutting losses of banana fruits.

Cost

- Unit cost : ₹ 150

Impact and benefits

- Reduces post-harvest losses up to 6%
- Reduces human drudgery and save time.

Manufacturers

- M/s National Agro Industries, Link Road Industrial Area- A. Opp. Transport Nagar Ludhiana 141003 (Punjab)



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Manual Pineapple Peeler-cum-Corer

Salient features

- Removes peel and core from pineapple and simultaneously slice it into pieces.

Performance

- Capacity : 20 fruits/h
- Efficiency : 95%



Cost

- Initial investment : ₹ 300
- Operating cost : ₹ 1/ fruit

Impact and benefits

- Higher capacity and safe in operation.
- Drudgery reduction and ease of operation.

Manufacturers

- M/s Sneha Packaging
Berhampur (Odisha)

Contact

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AICRP on Post Harvest Technology
College of Agricultural Engineering and Technology
Orissa University of Agriculture and Technology
Bhubaneswar 751003 (Odisha)
Tel.: 0674-2564774 E-mail: phts.ouat@gmail.com

Raw Mango Peeler

Salient features

- Rotation of mangoes in the elliptical chamber formed between concave wheel, guide and casing peels the mangoes.
- Power : 1.5 kW motor



Performance

- Capacity : 200 kg/h

Cost

- Unit cost : ₹ 2,50,000

Impact and benefits

- Reduces time for peeling mangoes and increases labour productivity.
- Labour and time saving. Reduces fruit damage.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
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- M/s Dharma Technologies
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Tel.: 0816-2292159, 09886737260
- Best Engineering Technologies
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Garlic Clove Peeler

Salient features

- Peels the cloves dried at 65°C for 30 minutes.

Performance results

- Capacity : 12 kg/h
- Efficiency : 85%



Cost

- Unit cost : ₹ 25,000

Impact and benefits

- Increases efficiency of labour, reduces time and ensures hygienic operation.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
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Upparahalli Main Road, Tumkur 572 102 (Karnataka)
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E-mail: director@iihr.ernet.in Website: www.iihr.ernet.in

Hand Operated Pomegranate Aril Remover

Salient features

- Pomegranate is cut into two halves and kept upside down and the hitting head hits the fruit.
- The arils are removed from the fruit and collected.

Performance

- Capacity : 50 kg
- Efficiency : 96%

Cost

- Unit cost : ₹ 5,000



Impact and benefits

- Increases efficiency of labour, reduces time and ensures hygienic operation.
- Reduces fruit damage.

Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
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E-mail: director@iihr.ernet.in Website: www.iihr.ernet.in

White Pepper Decortication Machine

Salient features

- Suitable for production of white pepper corns from freshly harvested mature green pepper berries and black pepper with additional microbial retting treatment.

Performance

- Capacity : 125-150 kg/h

Cost

- Unit cost : ₹ 30,000

Impact and benefits

- Making white pepper instead of conventional black pepper adds value. Good export potential.
- Clean and hygienic production of white pepper.

Manufacturer

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006



Contact

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GKVK, Bengaluru – 560065
Tel.: 080-23330153 Extn 345, 346
Telefax: 080-23545640

Oil Palm Empty Fruit Bunch Fibre Extractor

Salient features

- Power : 22 kW motor
- Manpower : 3 Person.

Performance

- Two grades of fibres can be extracted
- Capacity : 440 kg/batch



Cost

- Unit cost : ₹ 1.40 lakh (including motor)
- Operational cost : ₹ 1,272/tonne

Impact and benefits

- EFB are by-product in palm oil mills.
- EFB extracts, fibre and grades it continuously.
- EFB fibre can be used for various industrial purposes, i.e. mattresses, car seats, insulation, composite panels, medium-density fibreboards, thermal insulating materials, packaging materials, coir geo-textiles etc.

Manufacturers

- Process Ekuipment Engineers
Process Nagar, Kovaipudur, Coimbatore (Tamil Nadu)

Contact

Director
Directorate of Oil Palm Research
Pedavegi 534 450 (Andhra Pradesh)
Tel.: 08812-259532/ 524/ 409
Fax: 08812-259 531

Cassava Peeling knife

Salient features

- Cassava peeling knife has been developed and evaluated at starch and sago factory in Salem.



Performance

- Output : 132 kg/h
- Flesh loss : 1.38% as compared to 5.70% by traditional knife.

Cost

- Unit cost : ₹ 40

Impact and benefits

- Specifically designed for starch and sago factories.
- Higher output and lower flesh loss.

Manufacturers

- M/s Varalakshmi Starch Industries Pvt. Ltd.
Varalakshmi Tower, II Floor No. 127/1
Gandhi Road, Salem-636007 (Tamil Nadu)
Tel.: 0427-2316280/81
Fax: 0427-2318854
E-mail: varastarch@gmail.com

Contact

Director

Central Tuber Crops Research Institute, Thiruvananthapuram 695017 (Kerala)
Tel.: (+91) (471) 2598551 Fax: (+91) (471) 2590063

Banana Fibre Extractor

Salient features

- It is portable and operates with single phase 0.75 kW electric motor.

Performance

- Capacity manual : 500-600 g/ 8 h/person
- Capacity machine : 15-20 kg dry fibre/ 8 h
- 100 stems processed in 8-10 h period.
- 150 g of fibre can be extracted from a single pseudostem.



Cost

- Unit cost : ₹ 50,000
- Operating cost : ₹ 25 to 45/ kg
- Cost of fibre : ₹ 80-100/ kg

Technology impact

- Value addition to banana pseudostem.
- Easy to handle even by women.

Manufacturers

- M/s. Raki Industries
8-24-7, Subba Rao Street, Gandhi Nagar Kakinada 533004
East Godavari District, Andhra Pradesh, Tel.: 0884-2300362
- M/s. A.P. State Agro Industries Development Corporation
Hyderabad 500004 (Andhra Pradesh)

Contact

Director

Central Tobacco Research Institute
Rajahmundry 533 105 (Andhra Pradesh)
Tel.: 0883-2449871-4 Fax: 0883-2410555
E-mail: ctri@sify.com Website: ctri.org.in

Portable Gins

Salient features

- Portable ginning machines are useful to breeders, seed companies, traders, marketing agencies and farmers etc. for ginning small seed cotton (*kapas*) samples.
- All the machines are provided with safety guards for operator's safety.



Cloy Gin

Performance

- Power : 0.37, 0.75 and 2.23 kW motor
- Capacity : Lilliput Gin : 5 kg seed cotton/h
CLOY Gin : 12 kg seed cotton/h
Hipro Gin : 50 kg seed cotton/h



Hipro Gin

Cost

- Unit cost of Lilliput Gin : ₹ 20,000
- Unit cost of CLOY Gin : ₹ 30,000
- Unit cost of Hipro-Gin : ₹ 55,000

Impact and benefits

- Easy to handle and portable.

Manufacturer

- M/s Precision Tooling Engineers
C-69, MIDC, Hingna Road
Nagpur 440028 (Maharashtra)
E-mail : pte69-ngp@sancharnet.in
Tel : 07104 236787, 237507
Fax : 07104-235307



Lilliput Gin

Contact

Director

Central Institute for Research on Cotton Technology
Adenwala Road, Matunga, Mumbai 400019 (Maharashtra)

Tel.: 022-24127273/76, 24184274, 24157238

Fax.: 022-24130835, 24157239

Email: circot@vsnl.com

Hand Tool for Easy Separation of Arils from Pomegranate

Salient features

- The hand tool consists of fruit holders having knife arrangement in such a way that it only penetrates into the peel.
- Pomegranate fruit has to be held between the pair of holder, and the holders are turned by hand in opposite direction of each other.
- Rotating action of the holders, leads to breaking of fruits.
- During this action the whole fruit experiences a shearing effect, and due to this effect the inside arils become loose and get separated.
- One labour is required to operate this tool.



Performance

- About 40-45% arils are separated in the process of irregular breaking.
- Rest of arils becomes loosened and are easily separated by using finger tips.

Cost

- Unit cost : ₹ 650

Impact and benefits

- Useful for small scale fruit juice processors and fruit juice vendors for easy, hygienic and fast separation of arils.
- Saves 50% time

Manufacturer

- M/s Padmatech Engineering Systems
Plot No. 219, Sector No. 10 PCN TDA, Bhosari,
Pune 411026 (Maharashtra)
Mobile: 07798882629 Email: padmatechengg@yahoo.co.in

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E-mail: ciphet.icar@gmail.com, director@gmail.com

Website: www.ciphet.in

Millet Thresher-cum-Pearler

Salient features

- Dimension (l×b×h) : 600×310×1,040 mm
- Weight : 45 kg
- Power source : 750 W motor



Performance

- Capacity : 30-35 kg /h
- Efficiency : 98%
- Pearling capacity : *Mandua*/Finger millet : 40-45 kg /h
- *Madira*/ Barnyard millet : 2.5-3.0 kg/h

Cost

- Unit cost : ₹ 12,000

Impact and benefits

- Increases the working efficiency thereby saving time and energy.
- Reduces drudgery.
- Reduces the labour requirement thus increasing the income.
- Do not cause any air pollution and socially accepted by all categories of farmers.

Manufacturer

- M/s Punjab Agricultural Implements (P) Ltd.
Saharanpur (Uttar Pradesh)

Contact

Director

Vivekanand Parvatiya Krishi Anushandhan Sansthan

Almora 263601 (Uttarakhand)

Tel.: 05962-230208

E-mail: vpkas@nic.in

Website: www.vpkas.nic.in

Soybean Dehuller

Salient features

- It produces soysplits (*dbhal*) free from hull and broken.
- Dehulling takes place in the annular space between cylinder.
- Dimension (l×b×h) : 1,700×620×1,330 mm
- Weight of machine : 35 kg
- Manpower requirement : 3.0 man-h/100 kg



Performance

- Output capacity : 100 kg/h

Cost

- Unit cost : ₹ 15,000 (approx.)
- Operating cost : ₹ 33/100 kg

Impact and benefits

- Capacity enhancement over operation without machine.
- Reduces drudgery.
- Value addition.

Manufacturers

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683

Contact

Director
Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2737191 Fax: 0755-2734016
E-mail: director@ciae.res.in

Automatic Custard Apple Pulper

Salient features

- Pulper cuts, scoops and pulps the flesh.
- Pneumatic actuators and electronic controls are used.

Performance results

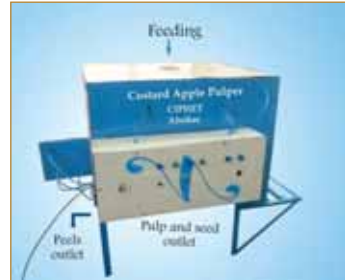
- Capacity of cutting : 120 kg/h
scooping and pulping
- Capacity of pulp recovery : 70-72%

Cost

- Operating cost : ₹ 50/100 kg

Impact and benefits

- It brings higher value for fruits leading higher income.
- Generate employment opportunity.
- Benefits tribal farmers.



Manufacturers

- NexGen Drying Systems,
C902 Sigma One Building, Pune 411038 (Maharashtra)
Tel.: 020-24392372
E-mail: shivananad@nexgenau.com

Contact

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Manual Arecanut Dehusker

Salient features

- Suitable especially to small holdings for dehusking freshly harvested mature green arecanut.
- It replaces traditional dehusking tool drudgery.
- Simultaneously four persons can dehusk arecanuts.
- The hopper holds 20 kg raw nuts and the raw nut freely flows to the dehusking tray by gravity.



Performance

- 160 kg fresh arecanut nut per day/person

Cost

- Unit cost : ₹ 5,500

Impact and benefits

- Drudgery is drastically reduced.
- Cost of dehusking reduced by 10%.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260

Contact

Research Engineer
AICRP (PHT), University of Agricultural Sciences, GKVK, Bengaluru 560065 (Karnataka)
Tel.: 080-23330153 Extn 345, 346
Telefax: 080-23545640

Women Friendly Rotary Arecanut Dehusker

Salient features

- Arecanuts compressed between the conveying screw and cutting tips, the husk is peeled off and the kernel is ejected by the leads on the conveying screw.
- Anthropometric design.
- The dehusker unit was ergonomically evaluated and the mean values for capacity and working heart rate were 5.0 kg/h and 108 beats/min, respectively.
- Dimension (l×b×h) : 600×450×900 mm
- Weight : 20 kg
- Hand cranking speed : 60 rev/min
- Manpower requirement : One person



Performance

- Capacity : 5.0 kg/h

Cost

- Unit cost : ₹ 3,000
- Operating cost : ₹ 63/h

Impact and benefits

- The dried conventional method is highly labour intensive, time consuming, uneconomical and above all very unsafe for fingers and palms.
- This machine helps to reduce the drudgery as well as injuries to workers during this operation.
- Women friendly technology
- Possibility of injuries to fingers and palm toatally eliminated.

Manufacturer

- M/S Krupa Fuel Engg. Works Gimone
Dapoli dist. Ratnagiri 415712 (Maharashtra)

Contact

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Central Institute of Agricultural Engineering,
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E-mail: lpgite@ciae.res.in

Cassava Chipping Machine

Performance

- Higher output, low operational cost, uniform chips, variable chip thickness.
- Capacity: 83 kg/h with 0.9 mm thickness

Cost

- Unit cost of hand operated chipping machine: ₹ 9,000
- Pedal operated chipping machine: ₹ 14,000

Impact and benefits

- Drudgery with manual chipping is eliminated.

Manufacturers

- Peermade Development Society, P. B. No.11, Peermade-685531 Idukki (Kerala)
- Hans Roever KVK
Valikandapuram 621115 Perambalur (Tamil Nadu)
Tel.: 0438-293251/ 293592
- Mr. Tony Thomas
Kijhakkekara, Irumpakachola P.O.
Kanjirapuzha-678591, Palakkad (Tamil Nadu)
Tel.: 09447058253 E-mail: tonythomas@yahoo.com
- Mr. Sabu, Kathpaloth House
Konnakkal D.O. Kasaragod (Kerala)



Hand operated



Pedal operated

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Palmyrah Fibre Separator

Salient features

- Utilizes impact force of rotating drum and combing action by nails to process the fronds and converting them into fibre.



Performance

- Capacity : 50-60 kg/8h

Cost

- Unit cost : ₹ 35,000

Impact and benefits

Manufacturer

- M/s Sri Vijaya Lakshmi Engineering Works
#4-340/19, Alwar Nagar
Lala Cheruvu, Rajahmundry/ East Godavari District (Andhra Pradesh)
Tel.: 9849726448, 9849137583

Contact

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Central Tobacco Research Institute
Rajahmundry 533105 (Andhra Pradesh)
Tel.: 0883-2449871-4 Fax: 0883-2410555
E-mail: ctri@sify.com

Miniature Spinning System

Salient features

- Helps in assessment of spinning quality of cotton fibre samples and for preparation of sliver and yarn samples.
- The system consists of
CIRCOT Miniature Carding Machine
CIRCOT Miniature Draw frame
CIRCOT Miniature Sliver to Yarn Spinner
CIRCOT Rotor OE Spinner
- Inverter drive systems have been employed for easy settings of various processing parameters.
- Fitted with safety and emergency stop switches.
- Machines are operator friendly and the entire spinning process can be completed within one hour.



Carding Machine



Draw frame

Performance

- Output capacity: 100 g/h (cotton sample)
- Manpower: 2 nos. (one skilled and one semi - skilled)
- Power requirement (card + drawn frame): 600 kW motor
- Power requirement sliver yarn : 1 kW

Cost

- Unit cost : ₹ 28 lakh

Impact and benefits

- Fibre samples and their blends weighing as low as 40 g can be processed easily to produce sufficient quantity of yarn for quality evaluation.
- Suitable for trade, textile mills, research laboratory, educational institutions, training centres and agricultural research stations for assessing spinning quality and potential of small fibre samples.



Rotor OE Spinner

Post Harvest

- Saves valuable foreign exchange, provides ultra-modern system for cotton quality evaluation in terms of its spinning potential.

Manufacturer

- M/s. Trytex machines company
29, Bharathiar Road, Coimbatore 641006
Tel.: 0422-2532760 Fax: 0422-2531944
E-mail: trytex@rediffmail.com



Sliver to Yarn Spinner

Contact

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Adenwala Road Matunga, Mumbai 400019 (Maharashtra)
Tel.: 022-24127273/76, 24184274, 24157238
Fax: 022-24130835, 24157239 E-mail: circot@vsnl.com

Makhana Popping and Decortication Machine

Salient features

- Traditional processing of *Makhana* seeds involves drudgery and safety problems.
- The machine consists of a hopper, screw conveyor type roaster (having two continuous barrels, one heated with oil and other by mounting three band heaters).
- The residence time of roasting in barrel is controlled.
- Two motors of 0.5 to 1.0 hp are required.



Performance

- Popping capacity : 30-35 kg raw seeds.
- This machine can also decorticate the conditioned *makhana* seeds (gorgon nut).
- Popping and decortication percentage: 90.

Cost

- Unit cost : ₹ 1,50,000

Impact and benefits

- Time saving and drudgery reduction of traditional processing.
- Improves the safety of processors.

Manufacturer

- M/s Jwala Engineering and Consultancy Services
354, Sector 2, Growth Centre, Saha, Ambala 133104 (Haryana)
Tel.: 0171-2821836 E-mail: jwalaecs@in.com

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Website: www.cipheth.in

PKV Mini Dal Mill

Salient features

- Dimensions (l×b×h) : 1,500×1,300×1,800mm
- Weight : 320 kg
- Power source : 2.2 kW motor

Performance

- Capacity (Pigeonpea) : 100-125 kg/h
- Recovery (Pigeonpea) : 72-75%
- Black/greengram : 125-150 kg/h
- Recovery (Black/greengram) : 80-82%



Cost

- Unit cost : ₹ 55,000
- Total initial investment : ₹ 6,00,000
- Operating cost : ₹ 220/h

Impact and benefits

- Increased *dal* recovery of about 17 % over conventional system.
- Decrease in losses as broken.
- Generates gainful employment for rural youth.
- Sound and air pollution is reduced.

Manufacturers

- J.S. Corporation
Mangaldas Market, Akola 444001 (Maharashtra)
Tel.: 0724-2433660
- Annapurna Machinen Fabrik, Pvt. Ltd.
F – 10/2, MIDC, Shirol, Kolhapur 416122 (Maharashtra)
Tel.: 0230 – 2468665, 2468903 Mobile: 9764999800
- Ajay Industries
C-3, MIDC area, Amravati 444605 (Maharashtra)
Tel.: 0721-2520305
- Eros Metal Works (P) Ltd.
G-5, MIDC Industrial Area, Hingana Road, Nagpur 440028 (Maharashtra)
Tel.: 07104-237775/ 236288/ 320793

Post Harvest

- R.K. Industries
D-39, Phase-II, MIDC, Akola 444104 (Maharashtra)
Mobile: 9423428980
- Group Surya
Balaji Residency, Plot no.- 50, Flat no.-2, Mahatma Phule Nagar,
Chinchwad, Pune 411019 (Maharashtra)
- Shri Ram Associates
Plot no. – J/27, Phase-III, MIDC, Akola 444104 (Maharashtra)
Tel.: 0724-2258325 Mobile : 9823090002
- Ma Durga Plastic Products
J-19, Phase-III, MIDC, Akola-444104 (Maharashtra)
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Krishi Nagar, Akola 444 104 (Maharashtra)
Tel.: 0724-2258266 (0)

CIAE Mini dal Mill

Salient features

- For production of split pulses (*dal*) from pigeonpea, greengram, lentil and blackgram
- Dimensions (l×b×h) : 770×630×1,020 mm
- Weight : 90 kg
- Manpower requirement : 1.0 man-h/100 kg



Performance

- Power : 1.5 kW motor
- Man power : 1 No.
- Output capacity : 100 kg/h

Cost

- Unit cost : ₹ 19,000 (approximately) without motor.
- Operating cost : ₹ 17/100 kg

Impact and benefits

- Increase in *dal* yield and improvement in *dal* quality.
- Reduction in drudgery.
- Increase in capacity.
- Rural employment generation.
- Income generation.

Manufacturers

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683

Contact

Director

Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2737191, Fax: 0755-2734016
E-mail: director@ciae.res.in

Multi-purpose Grain Mill

Salient features

- Multi-purpose grain mill is suited for grinding of cereals, pulses, coriander, cumin etc.
- Power source : 750 W motor



Performance

- Capacity : 10-20 kg/h for spices and 50-70 kg/h for *dal*

Cost

- Unit cost : ₹ 19,000

Impact and benefits

- Drudgery reduction.
- Suitable for cottage scale enterprises.

Manufacturers

- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683
- M/s Yashodha Engineering
Shop No. 14, New Rajiv Nagar, Bhopal (Madhya Pradesh)
Tel.: 0755-2589119, 5275848
- M/s Vinod Enterprises,
104, Sector-I, Industrial Estate, Govindpura,
Bhopal 462023 (Madhya Pradesh)
- M/s Venkatesh, Agro Engineering Works,
C-30, Additional MIDC, Jalna 431203 (Maharashtra)
Tel.: 02482-220049

Contact

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Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2737191 Fax: 0755-2734016
E-mail: director@ciae.res.in

Rice Flaking Machine

Salient features

- Graded, sorted paddy is soaked in hot water for about 8-10 hours.
- The rollers of flaking machine are adjusted according to the fineness of the flakes desired.
- Paddy is pressed into fine flakes and bran separated.



Performance

- Capacity : 200-300 kg/h

Cost

- Production cost : ₹ 5/kg

Impact and benefits

- Value added product from rice can be prepared.
- Generates employment.
- Improves income.

Contact

Head

Department of Agricultural Process and Food Engineers
Faculty of Agricultural Engineering, Indira Gandhi Krishi Vishwavidyalaya
Raipur 492012 (Chhattisgarh)
Tel.: 0771-2444254 (0)
E-mail: 0771-2444254

Grain Puffing Machine

Salient features

- Rice is puffed in 10-12 seconds using sand at temperature varying from 250 to 270 °C
- Sand : grain ratio being about 8:1.

Performance

- Capacity : 8-10 kg/h

Cost

- Investment : ₹ 1,500
- Processing cost : ₹ 2.50/ kg

Impact and benefits

- The capacity of rice-puffing machine is four times as compared to the traditional method.
- It can be used for puffing raw paddy, maize, gram, kodo etc.
- Saves labour, reduces drudgery and minimizes accidents.

Manufacturer

- M/s R.K. Steel
Antila, Bagnan, Howrah – 711312 (West Bengal)



Contact

AICRP on PHT
Agricultural and Food Engineering Department,
India Institute of Technology, Kharagpur 721302 (West Bengal)
Tel.: 03222-2831118

Soybean Flaking Machine

Salient features

- It presses and stretches the grain into thin elongated flakes of soybean, sorghum, corn and bengal gram.
- Blanched soy *dal* at 25-30% moisture content is flaked.
- Dimension (l×b×h) : 400×355×550 mm
- Weight : 80 kg
- Manpower requirement : 5.0 man-h/100 kg



Performance

- Manpower : 1 No.
- Output capacity : 20 kg/h

Cost

- Unit cost : ₹ 20,000
- Operating cost : ₹ 75/100 kg

Impact and benefits

- Capacity enhancement over traditional method.
- Reduces drudgery.
- Value addition of produce for income and employment generation.

Manufacturers

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
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Cottage Scale Soy Paneer Plant

Salient features

- It is a cottage level plant to produce soy milk and *paneer*.
- Steam generation, grinder-cum-cooker, milk filtration and *paneer* pressing device are the main components.
- Dimension (l×b×h) : 3,000×3,000×3,000 mm
- Weight : 200 kg
- Manpower requirement : 75 man-h/100 kg



Performance

- Capacity : 200kg soymilk/day or 50 kg soy *paneer*/day.

Cost

- Capital investment : ₹ 3 lakh
- Operating cost : ₹ 62/h

Impact and benefits

- Good quality soy milk and tofu are produced.
- Health benefits to consumers.
- Income and employment generation.

Manufacturer

- M/s Global Engineers and Equipments Co.
109, M.G. Road, Bastin Bazar, Asansole (West Bengal)

Contact

Director
Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road,
Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2737191 Fax: 0755-2734016
E-mail: director@ciae.res.in

Paneer Pressing Device

Salient features

- It is a screw type press to produce *paneer* blocks.
- Dimension (l×b×h) : 650×510×940 mm
- Weight : 45 kg
- Manpower requirement : 6.0 man-h/100 kg



Performance

- Manpower : 1 No.
- Output capacity : 8-10 kg/h

Cost

- Cost : ₹ 4,000
- Operating Cost : ₹ 60/100 kg

Impact and benefits

- Reduces drudgery and produces a better product.
- Value addition of milk.

Manufacturer

- M/s Fine Fabrication Works
104/A Sector I, Industrial Area, Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2589119
- M/s Shri Manak Industries
70 B, Sec. H, Industrial Area, Govindpura,
Bhopal 462023 (Madhya Pradesh)
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E-mail: director@ciae.res.in

Raw Mango Slicer

Salient features

- It slices mango longitudinally into 4, 6 or 8 of 20 mm width.
- Power : 4.5 kW

Performance

- Capacity : 0.8 tonne /h

Cost

- Unit cost : ₹ 2,50,000

Impact and benefits

- It increases efficiency of labour and reduces time.
- Reduces fruit damage compared to manual slicing method.



Manufacturers

- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260
- Best Engineering Technologies
#162, Prashanth Nagar, E. Kukatpally,
Hyderabad 500072 (Andhra Pradesh)

Contact

Director

Indian Institute of Horticultural Research
Hessaraghatta Lake P.O., Bengaluru 560089 (Karnataka)

Tel.: 080-28466420 Fax: 080-28466291

E-mail: director@iihr.ernet.in

Website: www.iihr.ernet.in

Raw Mango Cube Cutter

Salient features

- Raw mango slices are passed through cube cutter to produce slices of approximately $25 \times 20 \times 1.6$ mm.
- Power : 3.75 kW

Performance

- Capacity : 0.5 tonne/h

Cost

- Unit cost : ₹ 2,50,000



Impact and benefits

- Increases efficiency, reduces time and ensures hygienic operation.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260
- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- Best Engineering Technologies
162, Prashanth Nagar, E. Kukatpally, Hyderabad 500072 (Andhra Pradesh)

Contact

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E-mail: director@iihr.ernet.in
Website: www.iihr.ernet.in

Tamarind Dehuller-cum-Deseeder

Salient features

- Useful for dehulling of freshly harvested matured dry tamarind fruits and expelling seeds.

Performance

- Dehulling capacity : 600 kg/h
- Deseeding capacity : 45 kg/h



Cost

- Unit cost : ₹ 40,000

Impact and benefit

- Easier Tamarind processing with reduced cost of processing.

Manufacturer

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260

Contact

Research Engineer
AICRP on PHT, University of Agricultural Sciences, GKVK, Bengaluru 560065 (Karnataka)
Tel.: 080-23330153 Extn 345, 346
TeleFax: 080-23545640

Bio Mass Fired Copra Dryer

Salient features

- Split on MS grill.
- A door is provided for loading and unloading of fuel.
- Dimension (l×b×h) : 1,500×1,100×920 mm
- Capacity : 1,000 nuts per batch



Performance

- It takes 20 h including 3 h of preheating to reduce initial moisture content of 55% to final moisture content of 6% (w.b.) with 80 kg fuel.
- Average temperature in drying chamber: 50-55 °C.
- Quality of dried copra 70% white, 20% brown and 10% dusty copra.

Cost

- Unit cost : ₹ 30,000-50,000

Impact and benefits

- Reduces drying time by 50% and yields good quality copra.
- Saves time, manpower and energy.
- Locally available biomass may be utilized, enhancing net return to farmers.

Manufacturer

- M/s Shree Hari Fabricator
Plot D809, Industrial Estate, Bathubasthi
Port Blair 744101 (Andaman and Nicobar Islands)

Contact

The Director
Central Agricultural Research Institute
P. B # 181, Port Blair
Andaman and Nicobar Islands – 744101
Tel.: 03192-250436 Fax: 03192-251068
E-mail: directorcaripb@gmail.com

Small Scale Lac Processing Unit

Salient features

- The process of making seedlac from sticklac involves crushing, washing, drying, winnowing and grading.
- Small scale lac Processing Unit comprises lac crusher, washer, grader and winnower. Machines can be driven manually or with electric motor.



Performance

- Capacity: 100 kg/day

Cost

- Working shed for raw material and finished product storage : ₹ 5,00,000
- Installation : ₹ 1,00,000
- Working capital (3 months) : ₹ 8,00,000

Impact and benefits

- Refinement/primary processing of lac using small scale lac processing unit possible at village level.
- Fetches higher price resulting in increased income.
- Self employment generation.

Manufacturer

- M/s. National Entreprises
72-74 'B' Industrial Area, Tupudana, Hatia
Ranchi 834003 (Jharkhand)
Ph. No. 0651-2290138 (workshop)
0651-2291145 (office)

Contact

Director
Indian Institute of Natural Resins and Gums
Namkum, Ranchi 834010 (Jharkhand)
Tel.: 0651-2260117, 2261156, 2261069
Fax: 0651-2260202

Dal Chakki

Salient features

- It is rubber-steel disk type vertical *chakki* with stationary rubber and rotating steel disks, auger feed system for uniform feed rate and cyclone separator to remove husk.
- Dehusking and splitting is performed softly.
- Feed rate is controlled through hopper outlet.
- Provision for gap adjustment between the disks according to grain size.
- 1.5 hp, 220 V, single motor and operated by single operator.



Performance

- Capacity: 75-125 kg/h for different pulses.

Cost

- Unit cost : ₹ 30,000
- Operating cost : ₹ 28/h
- Output cost : ₹ 0.19/kg

Impact and benefits

- *Dal* recovery is more than emery-based dehusking system.
- Potential to generate income and employment at rural threshold.
- Useful for dehusking and splitting of pulse crops except lentil.
- Suitable for cottage scale dehusking and splitting of pulses (leaves 10-15% husk cover over *dal*).

Manufacturer

- M/s Bharat Heavy Machines
G-20, Bajrang Bali Industrial Estate, Site-4, Panki,
Kanpur 208 020
(Uttar Pradesh)
Phones : 0512-22692577, 9839115497, 9336111261, 9935424256.
E-mail : bhmgroup@gmail.com

Contact

Director

Indian Institute of Pulses Research Kalyanpur, Kanpur 208 024

Tel.: (O) 0512-2572464/5 (Extn 238) (M) 09335662764

Website: www.iipr.res.in

Mini Dal Mill

Salient features

- Comprises grader for grading of raw material and finished products emery roller for pitting/scratching of grains rubber-steel disk *chakki* for dehusking and splitting and cyclone separator for removal of husk and light impurities.
- An improvement over IIPR *Dal Chakki*. 2.0 hp, 220 V, single phase motor.
- Feed rate controlled through hopper outlet.
- Provision for gap adjustment between the disks according to grain size.
- Operated by single operator.



Performance

- Capacity : 75-125 kg/h for different pulses.

Cost

- Unit cost : ₹ 50,000
- Operating cost : ₹ 30/h
- Output cost : ₹ 0.30/kg

Impact and benefits

- Mini *dal* mill developed at IIPR, Kanpur, is an improvement over *dal chakki* using rubber-steel disk *chakki* developed earlier.
- Better *dal* recovery.
- Used for dehusking of lentil, which was difficult to mill in vertical *chakki*.
- This unit can be a source of employment and income generation in rural areas.
- Useful for dehusking and splitting of all the pulse crops.

Manufacturer

- M/s Bharat Heavy Machines
G-20, Bajrang Bali Industrial Estate, Site-4, Panki,
Kanpur 208 020 (Uttar Pradesh)
Tel.: 0512-22692577, 9839115497, 9336111261, 9935424256
E-mail: bhmgroup@gmail.com

Contact

Director

Indian Institute of Pulses Research Kalyanpur, Kanpur 208024 (Uttar Pradesh)

Tel.: (0) 0512-2572464/5 (Extn. 238)

Website: www.iipr.res.in

Multi Purpose Grinder

Salient features

- Swinging hammer type multi-purpose grinder for grinding of chickpea broken for *besan*-making and grinding of spices, viz. coriander, chilli turmeric etc.
- 1.0 hp, 220 V, single phase motor.

Performance

- Capacity : 40 kg/h for *besan*
- Capacity : 2-10 kg/h for spices



Cost

- Unit cost : ₹ 25,000
- Operating cost : ₹ 25/h
- Output cost : ₹ 0.70/kg (*for besan*)

Impact and benefits

- *Besan*-making in hammer mill prevents increase in product temperature due to air circulation.
- The milled products of spices are with better aroma and colour retention.
- Useful for small and rural entrepreneurs.

Manufacturer

- M/s Bharat Heavy Machines
G-20, Bajrang Bali Industrial Estate, Site-4, Panki,
Kanpur 208020 (Uttar Pradesh)
Tel.: 0512-22692577, 9839115497, 9336111261, 9935424256
E-mail: bhmgroup@gmail.com

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Tel.: (0) 0512-2572464/5 (Extn 238)

Website: www.iipr.res.in

Autoclavable Microencapsulation System

Salient features

- The microcapsules are produced using two fluid glass nozzle atomizers in which the pressurized air or inert gas is used to break up the jet of matrix fluid (solution of sodium alginate/ chitosan/ carageenan/combination of these along with some other filler material such as starch to impart controlled release properties).
- The kinetic energy of high pressure air or inert gas is used for breakup of matrix fluid jet.
- The small droplets produced fall in reaction vessel. The reaction vessel contains divalent cations or polycationic substances; which results in ionotropic gelification yielding microcapsules.



Performance

- The wet alginate microcapsules ranging in size from 1,500 μm down to around 50 μm can be produced.
- Bacteriocins, enzymes, probiotics and prebiotics are encapsulated.

Cost

- Initial investment required: ₹ 50,00,000
- Operating cost : ₹ 350/ h (with 8 h working/day)
- Unit cost : ₹ 3,00,000

Impact and benefits

- Development of innovative functional foods is possible.
- Differentiation and enhancement of product value is possible.
- Microencapsulated ingredients can be used to mask undesirable flavours, prevent chemical reactions, improve delivery, control delay, increase stability of finished product, reduce production losses, increase quality of finished product, increase plant capacity without capital expense, improve yield, increase saleable products and increase profit.

- Useful in preparing functional foods and will ultimately lead to better health and nutrition.

Manufacturer

- M/s Singh Scientific Glass Works
266 D Rajguru Nagar,
Ferozpur Road, Ludhiana 141001 (Punjab)
Tel.: 093169-49909

Contact

Director

Central Institute of Post Harvest Engineering and Technology

PO:PAU Campus, Ludhiana 141004 (Punjab)

E-mail: ciphet.icar@gmail.com

Tel.: +91-161-2313135, 12 Fax: +91-161-2308670

Website: www.ciphet.in

Microencapsulator for Production of Microcapsule

Salient features

- A droplet generator in which liquid jet is broken into small droplets by multiple air jets of compressed air.
- The pressurized air/gas stream impinges upon the matrix fluid jet emerging from the inner nozzle and breaks the jet into small droplet in such a way that they fall in the gelling bath.
- Production of wet alginate microcapsules from 3 mm to 500 μm .
- The products encapsulated are *aonla* juice, ginger extract, stevia extract, yeast, and urease. The other applications include microencapsulation of bacteriocins, enzymes, probiotics and prebiotics.



Performance

- The capacity of the system is 3 kg of wet alginate microcapsules per batch.

Cost

- Initial investment : ₹ 70,00,000
- Operating costs : ₹ 350/h (with 8 h/working day)
- Unit cost : ₹ 3,00,000

Impact and benefits

- Develop innovative functional foods.
- Differentiation and enhancement in product value.
- Microencapsulated ingredients can be used to mask undesirable flavours, prevent chemical reactions, improve delivery, control delay, increase stability of finished product, reduce production losses, increase quality of finished product, increase plant capacity without capital expense, improve yield and increase saleable products and increase profit.
- Useful in preparing functional foods and will ultimately lead to better health and nutrition.

Manufacturers

- M/s Vaidehi Trading Company
58 A, Model Town, Karnal 132001 (Haryana)
Tel.: 08959924000
E-mail: mittalrk1@rediffmail.com
- M/s Unique Biotech Ltd
Plot-2, Phase-2, S.P. Biotech Park, Kolthur, Shameerpet Mandal, Ranga Reddy District 500078 (Andhra Pradesh)
Tel.: 040-23751346 Fax: 040-23751345
E-mail: info@uniquebiotech.com

Contact

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Tel.: +91-161-2313135, 12 Fax: +91-161-2308670

Website: www.cipheth.in

Ohmic Heating System for Stabilization of Rice Bran

Salient features

- Raw rice bran (freshly milled) is hydrated to a moisture content of 30% (w.b.) and electric current (AC, 50 Hz) is passed through it for 5-10 minutes to heat rice bran to 100 °C.
- Afterwards rice bran is dried to a moisture content of 8 % w.b. in a commercial dryer.

Performance

- Capacity : 50 kg/h
- Efficiency : 95%
- Losses : 0.1%

Cost

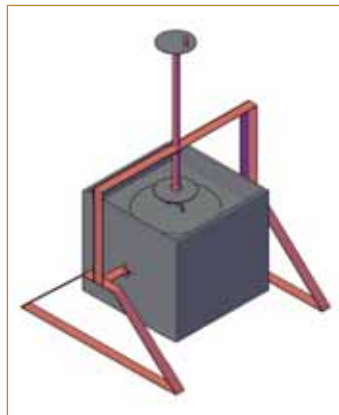
- Unit cost : ₹ 25,000
- Operating cost : ₹ 25/ kg

Impact and benefits

- In ohmic heating the material is heated due to internal heat generation and it is effective technically and commercially.
- The FFA content of stabilized rice bran is below 5% even after 45 days of storage.
- Stabilized rice bran can be put for food uses.

Manufacturer

- Priyanka Foodz Products, Chennai
9/4, Shobha Nagar, Ambattur
Chennai 600053 (Tamil Nadu)
Tel.: 098412 75614
E-mail: priyankafoodz@gmail.com



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Website: www.cipheth.in

Urea Molasses Mineral Block (UMMB) Machine

Salient features

- Produces urea-molasses mineral blocks.
- Mineral block of different sizes (22.5×4.5 cm \times desired thickness) and weight of 1 to 3 kg can be formed.

Performance

- Capacity : 150 kg/h

Cost

- Unit cost : ₹ 50,600
- Operating cost : ₹ 50 / 100 kg

Impact and benefits

- UMMB is suited for supplementing dry fodder-based diets for ruminants.

Manufacturer

- Division of Agricultural Engineering
Indian Agricultural Research Institute
Pusa, New Delhi 110012



Contact

Director

Indian Agricultural Research Institute

Pusa, New Delhi 110 012

Tel.: 011-25843375, 25842367 Fax: 011-25846420

E-mail: director@iari.res.in

Website: www.iari.res.in

PUSA Mobile Feed Block Machine

Salient features

- Feed blocks of 400 kg/m³ density from loose fodder are developed.

Performance

- 100 to 125 kg/h

Cost

- Unit cost : ₹ 3,95,200
: ₹ 1.0 / kg

Impact and benefits

- Reduces cost of transportation of feed block due to high density and compaction.

Manufacturers

- Division of Agricultural Engineering,
Indian Agricultural Research Institute
Pusa, New Delhi-110012



Contact

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Website: www.iari.res.in

Complete Animal Feed Block Formation Machine

Salient features

- Dimension (l×b×h) : 510×200×150 mm
- Complete feed block formation for animal feed and densification of biomass.
- Power : 22 kW electric motor
- Weight : 4 tonnes



Performance

- Capacity : 250-300 kg/h

Cost

- Unit cost : ₹ 7,17,600

Impact and benefits

- It is an effective solution for animal feed management.
- Animal feed blocks using straw and diet supplements such as molasses, concentrates, minerals and salts can be formulated.
- Requires less transportation and storage space.

Manufacturer

- Division of Agricultural Engineering,
Indian Agricultural Research Institute
Pusa, New Delhi-110012

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Powered Animal Feed Mixer

Salient features

- It is used for uniform mixing of cattle feed ingredients.
- Dimension (l×b×h) : 2,500×6,000×1,300 mm
- Power : 2.2 kW motor



Performance

- Capacity : 1 tonne/h

Cost

- Unit cost : ₹ 71,500

Impact and benefits

- Ensures uniform distribution of material in the feed block so that the block can be made palatable to the animals.

Manufacturer

- Division of Agricultural Engineering
Indian Agricultural Research Institute
Pusa, New Delhi-110012

Contact

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E-mail: director@iari.res.in

Website: www.iari.res.in

Feed Granulator

Salient features

- It is a drum type centrifugal granulator.
- Power source : 550 W motor

Performance

- Feed granules produced at 51-68% moisture content.

Cost

- Unit cost : ₹ 5,000
- Unit cost : ₹ 12, 000 for motorized unit

Impact and benefits

- Suitable for small or medium level factories.

Manufacturer

- CARD Krishi Vigyan Kendra
Pathanamthitta District Kolabhagom P.O.
Thadiyoor, Tiruvalla 689545 (Kerala)
Tel.: 0469-2662094/ 2661821
E-mail: cardkvk@yahoo.com

Contact

Director
Central Tuber Crops Research Institute
Thiruvananthapuram 695017 (Kerala)
Tel.: (+91) (471) 2598551 Fax: (+91) (471) 2590063
E-mail: ctcritvm@yahoo.com

Animal Feed Crusher

Salient features

- Crushing is a useful pre-treatment for increased drying rate.
- Power : 3.7 kW motor
- Weight : 300 kg
- Dimension (l×b×h) : 800×1,200×1,000 mm

Performance

- Capacity : 1.0 tonne/h

Cost

- Unit cost : ₹ 76,400



Impact and benefits

- Crushes the green and moist fodder to facilitate fast drying and ensures uniformly distributed material in feed block.

Manufacturer

- Division of Agricultural Engineering
Indian Agricultural Research Institute
Pusa, New Delhi-110012

Contact

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Pusa, New Delhi 110 012

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E-mail: director@iari.res.in

Website: www.iari.res.in

Evaporative Cooled Structure (5-7 tonnes)

Salient features

- The capacity of storage room is 5-7 tonne of fruits and vegetables.
- Special design of roof orientation.
- Uses wetted pad as cooling medium.



Performance

- Potato can be stored up to 55 days, Kinnnow up to 25 days in peak summer.

Cost

- Cost of construction varies, depending on cost of construction and wages.
- The cost of construction of evaporative cooled shucture (ECS) is about ₹ 2-4 lakh.

Impact and benefits

- If used throughout the year at its full capacity, storage cost decreases greatly.
- A bag of 60 kg potato for period of a season of three months in summer at full loading of ECS can be stored in about ₹ 38 which is about 45% cheaper than cold store.
- EC structure requires little energy to run a fan and water circulation motor, and has less initial investment and low cost of maintenance. It maintains a moderate low temperature and sufficiently high relative humidity for short term storage of fresh fruits and vegetables.
- Reduced post-harvest losses.
- Suitable for field heat removal.
- Saves energy and thus is environment friendly.

Manufacturers

- Project Manager
Krishana Foods and Seed Processor
Plot No 26, Industrial Area, Gurdaspur 143521 (Punjab)
Tel.: 01875-221462 Mobile: 9876268247
- Motion of Integrated Technology for Rural and Agricultural (MITRA)
Nayaka Gawn, Dharamshala Road, Sasaram 821 115 (Bihar)
Tel.: 06184-281280 E-mail: p95nath@rediffmail.com

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Director

Central Institute of Post Harvest Engineering and Technology

PO:PAU Campus, Ludhiana 141004 Punjab

E-mail: ciphethicar@gmail.com

Tel.: +91-161-2313135, 12 Fax: +91-161-2308670

Website: www.cipheth.in

Evaporative Cooled Room (2 tonnes)

Salient features

- The capacity of the storage room is 2 tonnes of fruits and vegetables.
- The evaporative cooled (EC) room requires no energy, less initial investment and low cost of maintenance.
- It maintains a lower temperature and higher humidity than the environment for short term storage of fresh fruits and vegetables.
- The EC room is double walled structure with space of 12 cm filled with fine sand.
- A drip system is connected at the top of the walls, so as to make the sand wet.
- Natural ventilation takes place in the room.
- Evaporation of water from wet walls of EC room leads to lower temperature and increased humidity inside the room.



Performance

- Early, mid and late season Kinnow could be stored for 32, 29 and 23 days in EC room as compared to 19, 16 and 11 days in ordinary room, respectively.
- Cauliflower, spinach, potatoes, and mature green tomatoes could be stored for 11, 5, 72, and 19 in EC room as against 5, 2, 44 and 8 days in ordinary room respectively.

Cost

- The cost of construction of EC room is ₹ 75,000

Impact and benefits

- Operating cost is ₹ 2/kg, which is 50% cheaper than cold store.
- Reduced post-harvest losses.
- Suitable for field heat removal.
- No energy required and thus an environment friendly.

Manufacturers

- Mr Vijayanand Singh, VNS Networks Service Patna (Bihar)
NC Lot, kankarbagh 800020 (Patna) Tel.: 09709378234
- Mr Rajeev Kumar Vill.PO-P.S-Chewara, Distt. Sheikhpura 811304 (Bihar)
Tel.: 09955406062
- Mr Manesh Jat H.O. 33 Supermarket Lal Kothi Kotputli, Jaipur (Rajasthan)
Tel.: 09829421294 E-mail: maet1998@gmail.com
- Krishana Foods and Seed Processor,
Plot No 26 Industrial Area Gurdaspur 143521 (Punjab)
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Porous Bricks

Salient features

- Made by mixing crop residues such as paddy straw, wheat straw and sawdust in brick earth in order to get higher water absorption, surface evaporation and lower dry weight.

Performance

- The bricks have lower self weight, density and higher porosity than conventional bricks.

Cost

- The cost of production ₹ 8/ brick.

Impact and benefits

- Better insulation in buildings.
- Higher cooling effect when used in evaporatively cooled storage structures.
- Requires much lower transportation and labour charges for handling in comparison to the conventional bricks.
- Used in evaporatively cooled storage structure and in buildings.

Manufacturer

- Rajinder Dev & Co.
Village Bhanohar, P.O. Mullanpur 141101 (Ludhiana)

Contact

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Nutraceuticals from Food and Non-Food Crops

Salient features

- Bench scale know-how has been developed for efficient extraction of nutraceuticals from food and non-food crops. Such health benefitting nutraceuticals include (i) anthocyanin concentrate from black carrot, (ii) anthocyanin concentrate from *jamun*, (iii) lycopene concentrate from tomato, (iv) capsaicinoid and capsanthin concentrates from red chilli (*Capsicum annum* L.), and, (v) phycocyanin concentrate from *Spirulina*.
- These antioxidants and natural colorants can be used as ingredients in value-added functional foods.

Performance

- Nutraceuticals derived from food and non-food crops aid specific bodily functions and provide health benefits of disease prevention through antioxidant activity and reduced disease risks.

Impact and benefits

- The extracted nutraceuticals can find applications in the development of nutraceutical-enriched baked products (breads, biscuits etc.), beverages (fruit drinks, alcoholic drinks) and other processed foods.
- The process for the production of such nutraceuticals is quite simple and technology is safe for adoption.
- Increased demand for such products will ultimately impact income of farmers producing nutraceutical-rich crops.

Manufacturer

- Ozone Biotech, Faridabad (Haryana)

Contact

Director

Indian Agricultural Research Institute

Pusa, New Delhi 110 012

Tel.: 011-25843375, 25842367 Fax: 011-25846420

E-mail: director@iari.res.in

Pusa Fruit Drinks

Salient features

- Ready-to-serve beverage
- 10-12.5% pulp
- No added colour, flavour and Class-II chemical preservatives
- Rich in nutraceuticals
- Thermally processed
- Shelf-life: 6-8 months
- Net profit margin: > 50%

Cost

- For about 5 lakh bottles per year, initial investment will be about ₹ 57,00,000 and the payback period would be one year with 100% capacity utilization.

Impact and benefits

- With the establishment of processing plants for nutraceutically rich Pusa fruit drinks, preservative free ready-to-serve drinks from both indigenous as well as other commercial fruits could be produced and marketed as healthy fruit drinks as against commercially available fruit drinks containing synthetic colour, flavour and added preservatives.
- Approximately net income of ₹ 6,00,000 annum can be generated.

Manufacturers

- M/s Alor Utshay Kalitala, Tribeni, Distt. Hooghly 712503 West Bengal
E-mail: utshay@yahoo.in Tel.: 033-26843942
- M/s Sahankar Paswan (Shankar Amrit Group of Agro Ford)
P. O. Mahanth : Maniyar Block-Kudhani Distt. Muzaffarpur (Bihar)
Tel.: 09939717743
- M/s Srikrishna Pickles, 43/3, Main Najafgarh, Gurgaon Road
Village Bajghera, Gurgaon (Haryana)
Tel.: 09868762511, 9868494021 E-mail: skp.cosuma@gmail.com
- M/s Goldwin Agro Foods
7/193, Ground Floor Single Storey, Ramesh Nagar New Delhi 110015
E-mail: info@goldwinagro.com



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E-mail: director@iari.res.in

Nutri Aonla Candy/ Pusa Aonla Candy

Salient features

- Non-thermal dewatering impregnation soaking (DIS) process has been used for development of *aonla* candy.
- The osmotic solution serves as a carrier of anthocyanins which are impregnated into *aonla* segments without affecting structural integrity of the material.
- The resultant product thus obtained contains anthocyanins in addition to ascorbic acid and phenolics.
- The osmotic syrup generated in the process can be utilized for formulating beverages or squashes.



Cost

- The cost of processing is ₹ 35/kg.

Impact and benefits

- The technology will help farmers get remunerative price for their produce.
- It is an appropriate technology and profitable venture for small and medium entrepreneurs with limited infrastructure and capital investment.
- *Aonla* is already well known for its therapeutic and medicinal value.
- The technology will boost value addition of *aonla*, reduces post-harvest losses and provides employment to young entrepreneurs.



Manufacturer

- Goldwin Agro foods
7/193 Ground Floor, Single Storey, Ramesh Nagar
New Delhi 110015
E-mail: info@goldwinagro.com

Contact

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Technology for Fruit Bar

Salient features

- Fruit bar is a concentrated fruit product made from mango, mango+*aonla* blend, guava+papaya blend, with a good nutritive value.
- The product is a dehydrated, packed in pouches and possesses good shelf-life.



Performance

- Batch process capable of producing 50-100 kg bars per day.



Cost

- Initial investment : ₹ 10,00,000
- Cost of product : ₹ 200-300/kg

Impact and benefits

- It is a concentrated fruit product with a good nutritive value prepared by drying fruit pulp.
- Use of this process may improve the scope for better use of natural resources and also in reducing the post harvest losses of these valued commodities. This is a highly nutritious product suitable for domestic consumption and international trade.

Manufacturer

- M/s Pee Pee Appliances Pvt. Ltd.
No. 255, Mint Street, Sowcarpet, Chennai 600079 (Tamil Nadu)
Tel.: 044-42888999
Fax.: 044-42888999

Contact

Director

Indian Institute of Horticultural Research,
Hessaraghatta Lake PO, Bengaluru 560 089 (Karnataka)
Tel.: 080-28466420-423 Fax: 080-28466291
E-mail: director@ihr.ernet.in

Process for Pusa Bajra Puff

Salient features

- It is a gluten free ready-to-eat puffed product and could be a boon to the segment of population suffering from celiac disease.
- It is rich in protein and micronutrients.
- Consumption of 100 g of this product can meet approximately 25% of the RDA of Fe and Zn in women.
- It is free from any artificial colour, flavour or preservatives.



Cost

- For about 100 kg/h, initial investment will be about ₹ 20,00,000 and unit product cost will be approximately ₹ 40/ kg.

Impact and benefits

- With establishment of processing plants for bajra puff, the demand of bajra will increase, which may fetch better prices.
- Approximately net income of ₹ 10,00,000/per annum can be generated.

Manufacturer

- Devesh Foods and Agro Products Pvt. Ltd.
1123 A-24 International Trade Tower
Nehru Place, New Dehli 110019
Tel.: 011-41049501 E-mail: info@dfapl.com

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Banana Health Drink

Salient features

- A highly nutritious and tasty health drink formulation developed using banana flour/powder after supplementing with suitable natural sources of proteins, minerals, vitamins and fat. It has a shelf-life of six months.



Performance

- 25 kg per day (8 hours)

Cost

- ₹ 110 per kg

Impact and benefits

- The technology will help in generating additional income to farmers over the existing system of selling raw fruits as such.

Manufacturers

- M/s Dorven Agro Eco Bioventures Pvt. Ltd.
F-4, Surabi Homes, Nehru Nagar Chromepet,
Chennai 600021 (Tamil Nadu)
- Shree Geetha Industries
501, Bansi Place Jeyashree Nagar
Junagarh 362041 Gujarat

Contact

Director

National Research Centre for Banana

Thogamalai Road, Thayanur Post, Tiruchirappalli 620 102 (Tamil Nadu)

E-mail: nrcbdirector@gmail.com Website: www.nrcb.res.in

Tel.: 0431-2618106, Fax: 0431-2618115

Banana Flower Pickle (Thokku)

Salient features

- The banana male bud, a waste material produced during crop production with less economic value is converted into a value added product, i.e. pickle (Thokku).
- The process involves removal of pistil, blanching, grinding and addition of spices and oil.
- It is rich in fibre and low in salt hence good for health. Banana flower has medicinal values.
- It is a low salt, low oil pickle suitable for all age groups.
- The product is stable for a year at room temperature.



Performance

- 200 kg per day (8 hours)

Cost

- ₹ 40 per kg of finished product



Impact and benefits

- The technology is simple and can be easily adopted by rural enterprises.
- The raw materials are easily available and the benefit:cost ratio is very high.

Manufacturers

- Mrs. N. Mary, Managing Trustee, M/s Rural Organization and Awareness Development (ROAD), 26/30, Ramalingapuram Street, Ambasamdrum, Tirunelveli District 627425 (Tamil Nadu)
- Mr. P.Ravichandran, Ganapathi Palayam, Kattu puthur P.O., Trichy 621207 (Tamil Nadu)
Tel.: 09994455048
- Mr. M. Prakash, Proprietor, Plantation Foods (P) Ltd., 7/3, Middle Street, Green Pirattiyur (P.O.), Sri Rangam, Trichy 620009 (Tamil Nadu)
- M/s Gramalaya, Garuda Pickles, 62-B, 10th Cross West, Further West Extension, Thillai Nager, Trichy 620018 (Tamil Nadu)
Tel.: 0431-2740263 E-mail: gramalaya@hotmail.com

Contact

Director

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Tel.: 0431-2618106 Fax: 0431-2618115
E-mail: nrcbdirector@gmail.com; Website: www.nrcb.res.in

Banana Stem Pickle

Salient features

- Being rich in fibre it helps in proper bowel movement.

Performance

- 200 kg per day (8 hours)

Cost

- ₹ 90 per kg

Impact and benefits

- The technology will help in generating additional income to farmers over the existing system of selling raw fruits.

Manufacturers

- M/s KRL Foods, 2/344-1, Kongu Gardens, Valayapatti Main Road, Rasi Palayam Village, Mohanur 637408, Namakkal Dist., (Tamil Nadu)
Tel.: 9994365883
- M/s Mangal Pickles, 10/59, Annai Illam Amma Mandapam, Road, Sri Rangam, Trichy 620006 (Tamil Nadu)
Tel.: 9442166609/ 8903714829
- M/s Garuda Pickles, 62-B, 10th Cross West, Further West Further West Extension, Thillai Nagar, Trichy 620018 (Tamil Nadu)
Tel.: 0431-2740263 E-mail: gramalaya@hotmail.com
- M/s Sri Amman Pickles, Ganapathi Palayam, Kattu Puthur (P.O) Trichy 621207 (Tamil Nadu)
Tel.: 09994455048



Contact

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Tel.: 0431-2618106 Fax: 0431-2618115
E-mail: nrcbdirector@gmail.com Website: www.nrcb.res.in

Banana Flour Soup Mix using Dried Banana Flower and Flour

Salient features

- Process involves mixing of banana flour, corn flour, dried vegetables and spices in various proportions.
- The product is stable for six months at room temperature without affecting quality.



Performance

- 25 kg per day (8 hours)

Cost

- ₹ 100 per kg

Impact and benefits

- It can be adopted by food processing industries for commercial production of banana soup. It can be adopted by small scale industries and suitable for rural enterprises.
- Banana male bud is a waste material which has several medicinal properties and the raw material is also easily available.

Manufacturer

- M/s Rural Organization and Awareness Development (ROAD)
26/30, Ramalingapuram Street, Ambasamdrum
Tirunelveli District 627425 Tamil Nadu

Contact

Director

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Enzyme Clarified Ready-to-Serve Banana Beverage

Salient features

- Process for conversion of pulpy banana into a clarified juice involves enzyme liquefaction. It is an energetic and nutritious beverage rich in minerals and vitamins.

Performance

- 1,000 litres per day (8 hours)

Cost

- ₹ 3.50 per 200 ml product

Impact and benefits

- It can provide good source of employment as well as back-ward support to farmers by providing remunerative price to the raw material.
- It is a nutritious drink with energy and vitamins. When served chill it is a good thirst quencher and gives instant energy. Good for children and adults.

Manufacturer

- M/s Gramalaya Garuda Pickles, 62-B, 10th Cross West Further West Extension Thillai Nagar, Trichy 620018 (Tamil Nadu)
Tel.: 0431-2740263 E-mail: gramalaya@hotmail.com



Contact

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E-mail: nrcbdirector@gmail.com Website: www.nrcb.res.in

Fruit Beverage Concentrate

Salient features

- Fruit beverage concentrate consisting of mango, pineapple, *aonla*, grapes etc.
- Developed beverage is free from added synthetic colours and flavours and safe for consumption even by the children.



Cost

- Initial investment : ₹ 30,00,000

Impact and benefits

- Reduction in post-harvest losses, better price to farmers due to avoiding of glut of particular fruit in the market. Availability of fruit in the form of product round the year in juice form to consumers.
- Better nutritional quality, good taste and flavour.

Manufacturer

- Mr. Vikas Kumar Jain
M/s. Pee Pee Appliances Pvt Ltd
No. 255 Mint Street, Sowcarpet, Chennai – 600 079, Tamil Nadu.
Tel.: 044-42888999 Fax: 044-42888999

Contact

Director

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Hessaraghatta Lake P.O., Bengaluru 560089 (Karnataka)
Tel.: 080-28466353 Fax: 080-28466291
E-mail: director@iihr.ernet.in

Mahua Flower Products

Salient features

- After removal of stigma from the dried flower it is cooked with water for 10 minutes. The pulp from the cooked *mahua* flower is obtained by wet grinder and utilized for preparation of jam and bar. Whole flower after stigma removal is dipped in sugar syrup and dried to obtain candied flower.



Performance

- 10 kg of dried *mahua* flower yields 35 No. of jars @500 g jam
- 10 kg of dried *mahua* flower yields 11.5 kg candied flower
- 10 kg of dried *mahua* flower yields 13.5 kg bar



Cost

- Jam : ₹ 30/500 g glass jar
- Candied flower : ₹ 8/100 g
- Bar : ₹ 4/50 g

Impact and benefits

- Utilization of *Mahua* flower for value addition
- Income and employment generation for tribal people

Manufacturer

- M/s Basundhara
Kuchinda, Sambalpur (Odisha)
Tel.: 0674-2407780, 2564774
E-mail: phts.ouat@gmail.com

Contact

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Tel.: 0674-2564774, 2407780 E-mail: phts.ouat@gmail.com

Value Added Products from Bael (Stone Apple)

Salient features

- After removal of mucilagenous matter, seed and fibre clarified pulp is used to prepare ready-to-serve (RTS) beverage, squash, jam and toffee resulting in value addition.



Performance

- 25 kg of *bael* yields 500 No. of bottles of 200 ml RTS
- 25 kg of *bael* yields 30 litres of squash
- 25 kg of *bael* yields 20 kg jam
- 10 kg of *bael* yields 1,000 No. of toffees

Cost

- Stone apple RTS : ₹ 4/200 ml glass bottle
- Stone apple squash : ₹ 22/750 ml glass bottle
- Stone apple jam : ₹ 20/500 g bottle
- Stone apple toffees : ₹ 0.40/ toffee

Impact and benefits

- Utilization of *bael* (stone apple) for value addition.
- Income and employment generation at rural level.

Manufacturer

- M/s Maruti Foods Kalna Nagar,
II Lane Near Lochapada, Berhampur 761001, Ganjam (Odisha)
Tel.: 09337505429

Contact

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Orissa University of Agriculture and Technology
Bhubaneshwar 751003 (Odisha)
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Osmo-Dehydrated Pineapple Products

Salient features

- After thorough cleaning of pineapples, they are sliced into 6-8 circular pieces with the removal of skin and hard core.
- The circular pieces are kept in sugar syrup of 57-60°B for 8 hours and dried at 70°C for 24 hours in a tray dryer.
- The broken pieces are dried in the same manner and titbits are made.
- RTS and squash are prepared from juice extracted out of thick skin/peel and leftover sugar syrup. The leftover of pineapple skin/peel with meal after juice extraction is called pineapple meal.
- This by product is used as an ingredient for cattle feed after drying and pulverization.



Performance

- 10,000 pineapples give 2,400 kg osmo-dehydrated rings and titbits

Cost

- Osmo-dehydrated pineapple ring : ₹ 10/5 pcs (100 g)
- Pineapple titbits : ₹ 9/100g

Impact and benefits

- Utilization of pineapple for value addition.
- Income and employment generation for tribal people.

Manufacturer

- Centre for Community Development
Paralakhemundi, Gajpati (Odisha)

Contact

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Tel.: 0674-2564774, 2407780 E-mail: phts.ouat@gmail.com

Cashew Apple Beverages

Salient features

- Ready-to-serve (RTS) beverage and squash are prepared from cashew apple by removal of astringency caused by tannins.



Performance

- 100 kg of cashew apple and 30 kg sugar make 400 bottles of 200 ml capacity RTS
- 100 kg cashew apple and 26 kg sugar make 75 bottles of 750 ml capacity squash

Cost

- Cashew apple RTS : ₹ 4.90/200 ml glass bottle
- Cashew apples quash : ₹ 16.75/750 ml glass bottle

Impact and benefits

- Utilization of cashew apple for value addition

Manufacturer

- Centre for Community Development
Paralakhemundi, Gajpati (Odisha)

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Cherry Squash

Salient features

- The product specifications include:
 - ◆ Pulp : 25%
 - ◆ Acidity : 1.5%
 - ◆ TSS : 50%
 - ◆ CMC : 0.75%
- It has various improvements over conventional method:
 - ◆ Output advantage/Higher recovery : 100 kg/day
 - ◆ Reduction in post harvest losses : 4 kg/100 kg
 - ◆ Labour cost reduction : ₹ 150/100 kg
 - ◆ Energy saving : ₹ 50/100 kg
 - ◆ Time saving : 8 h/day
 - ◆ Improvement in storage life : 180 days



Cost

- Cost of preparation including raw material and other inputs for preparation of 100 kg of product per day : ₹ 4,561
- Returns : ₹ 3,189
- Cost of machine and equipment : ₹ 75,000

Impact and benefits

- Owing to uniform cloud stability and natural colour of the product, consumer demand has been excellent.
- The technology will not only reduce the post-harvest losses but generate employment to unemployed youth leading to improvement in their economic conditions.
- Utilization of cherry for product development will produce minimum of 121 working days for minimum of 4 persons/annum/processing plant with a capacity to process one quintal of cherry per day.
- The technology is environment friendly as there is no emission of green house gases.

Manufacturers

- M/s Shah Foods, Food Park, Khunmoh, Srinagar (Jammu and Kashmir)
Tel.: 09419359800
- M/s Heaven Foods,
Industrial Estate, Shopian, Kashmir (Jammu and Kashmir)
Tel.: 09697965566

Contact

Research Engineer
AICRP on PHT, Srinagar Centre, Division of PHT
Sher-e-Kashmir University of Agricultural Sciences and Technology,
Shalimar 191121 (Jammu & Kashmir)
Tel.: 0194-246158/ 59 Fax: 0194-2461103
E-mail: drhafizahodhut@rediffmail.com

Plum Appetizer

Salient features

- The product contains:
 - ◆ Pulp : 18 %
 - ◆ Acidity : 0.5%
 - ◆ TSS : 15%
 - ◆ Sodium benzoate : 120 ppm
 - ◆ Cardamom : 0.75 g/litre
 - ◆ Black cumin : 1.0 g/litre
 - ◆ Black pepper : 1.0 g/litre
 - ◆ Black salt : 1.5 g/litre
 - ◆ Common salt : 2.50 g/litre
 - ◆ Ginger : 4.0 g/litre
 - ◆ Mint : 6.0 g/litre
- The improvement over conventional method include:
 - ◆ Output advantage/Higher recovery : 2.0 100 kg/day
 - ◆ Reduction in post harvest losses : 30.0 kg/ 100 kg
 - ◆ Labour cost reduction : ₹ 150/100 kg
 - ◆ Energy saving : ₹ 50/100 kg
 - ◆ Time saving : 8 h/day
 - ◆ Improvement in storage life : 180 days



Cost

- Cost of preparation including raw material and other inputs for preparation of 200 kg of product per day : ₹ 6,407
- Returns : ₹ 3,088
- Cost of machine and equipment : ₹ 70,000

Impact and benefits

- The production of plum appetizer has not only resulted in reduction in post-harvest losses but a new processed product with tremendous consumer acceptability and better shelf-life has been introduced in the market.
- Adoption of technology will generate employment to unemployed youth leading to improvement in their economic conditions.

- Utilization of plum for product development will produce minimum of 121 working days for minimum of 4 persons/annum/processing plant with a capacity to process two quintal of plums per day.
- The technology is environment friendly as there is no emission of greenhouse gases. The technology will lead to employment generation, economic development and better utilization of plum crop.

Manufacturers

- M/s Shah Foods (Jammu and Kashmir)
Food Park, Khunmoh, Srinagar
Tel.: 09419359800
- M/s Heaven Foods (Jammu and Kashmir)
Industrial Estate, Shopian Kashmir
Tel.: 09697965566

Contact

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Shalimar 191121 (Jammu & Kashmir)
Tel.: 0194-246158/ 59 Fax: 0194-2461103
E-mail: drhafizahodhut@rediffmail.com

Cherry Candy

Salient features

- The product contains:
 - ◆ Pitted cherry : 1kg
 - ◆ Sugar solution : 2 litres (75% strength)
 - ◆ Calcium chloride : 2%
 - ◆ Citric acid : 1.5%
 - ◆ Erythrosin colour : 0.5 %
 - ◆ KMS : 0.2%
- Since no technology for preparation of cherry candy was available, the technology developed by this centre itself is a new technology towards this end. The technology as such cannot be compared with any other technology.
- Output advantage/higher recovery : 10kg/day
- Reduction in post-harvest losses : 40.0 kg/100 kg
- Improvement in storage life : 270 days



Cost

- Cost of preparation including raw material and other inputs for preparation of 10 kg of product per day = ₹ 1,120
- Returns = ₹ 1,880/-
- Cost of machine and equipment = ₹ 1,00,000

Impact and benefits

- The technology is environment friendly as there is no emission of greenhouse gases.
- The technology will lead to employment generation, economic development and better utilization of cherry crop.

Manufacturers

- Local self-help groups of Kashmir
- Farm women
- Local cherry growers of Kashmir

Contact

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Whey based Mango-Herbal Beverages

Salient features

- Standardize the process for manufacture of *channa* whey-based mango beverages. The beverage prepared with 12% mango pulp, 8% sugar, 48% water and 32% whey containing 1.5% lemongrass distillate/*pudina* distillate (v/v) was found acceptable. The beverage had 19 °Brix, 0.2% acidity, 4.47% reducing sugar and pH 5.04.



Performance

- The product quality was acceptable to the sensory panellists and the consumers up to 60 days of storage under refrigerated conditions.

Cost

- The cost of 250 ml bottle beverage was calculated to be ₹ 7.65 with 15% margin.

Impact and benefits

- By product utilization

Manufacturer

- Mr. Dakeshwar Prasad
Gudhiyari, Raipur (Chhattisgarh)

Contact

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Faculty of Agricultural Engineering
Indira Gandhi Krishi Vishwavidyalaya
Krishak Nagar, Raipur 492012 (Chhattisgarh)
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Bottled Sugarcane Juice

Salient features

- The process of preserving the sugarcane juice involves peeling and crushing of cane, filtration, pasteurization and bottling of cane juice.



Performance

- By this technology sugarcane juice can be preserved in glass bottles for a period up to six months at room temperature.

Cost

- Equipment cost : ₹ 8,00,000
- Cost of product : ₹ 3/200 ml

Impact and benefits

- The value-added product will provide additional remuneration to farmers and the entrepreneurs.
- The juice, once extracted, deteriorates in a few hours, even sugarcane also becomes susceptible to staling and loss of sugar soon after harvesting, compelling distress sale by farmers.
- The process provides a solution to avert post-harvest losses of sugarcane in the form of a product which can be sold in bottled form for consumers in supermarkets.

Manufacturers

- Mr J. Sethupathy
G-3 Unit Industrial Estate, S. Vellalapatty, Karur 639004 (Tamil Nadu)
Tel.: 04324-42135
- Mr Rasi Ramalingam 22, I Street, Ghanaprakasam Nagar,
Pudicherry 605008
- Mr. Upendra K. Shah
Khode Pratishtham, Vishwasakhanatur Health Cure Centre
Khargone 451001 (Madhya Pradesh)

Contact

Agricultural Machinery Research Centre
Tamil Nadu Agricultural University
Coimbatore 641 003 (Tamil Nadu)
Tel.: 0422-6611272 Fax: 0422-6611455
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Liquid Jaggery Production Process

Salient features

- Mature and clean sugarcane is crushed by horizontal three roller crusher, followed by cleaning through double stage filtration system.
- Lime added for raising the pH of juice followed by clarification and scum removal. After concentrating the juice, liquid jaggery is cooled and preservative is added.
- Liquid jaggery is an intermediate product collected during jaggery making process.
- It is utilized as sweetening agent in food, drinks and also as table purpose in lieu of sugar or sugar syrup.



Performance

- 1,200 kg/day

Cost

- ₹ 35/kg

Impact and benefits

- The technology is useful in development of entrepreneurship for rural youth.
- Value addition of sugarcane.

Manufacturers

- Shri Sachin Balasaheb Patil
Vadange, Tal. - Karveer, Dist. Kolhapur (Maharashtra)
- Shri. Prakash Kadam A/p. Khed (Wadepul)
Tal. and Dist.
Satara (Maharashtra)

Contact

Research Engineer
Regional Sugarcane and Jaggery Research Station
Mahatma Phule Krishi Vidyapeeth, Rahuri
Opp. Market Yard, Kolhapur 416005 (Maharashtra)
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Method of Determining Maturity of Intact Mango on Tree

Salient features

- This method facilitates harvesting of mango at correct stage (depending upon the end-use) and sorting/grading of mangoes based on eating quality (taste) to get higher assured prices in market and to have an idea of shelf-life for future marketing.
- The colour values 'a' and 'b' of mango are measured using a colorimeter and marked on colour strips at x-and y-axes respectively. Perpendicular lines drawn from marked points on both the colour strips.
- Maturity level estimated by reading from the curved lines near the point of intersections of these perpendicular lines. The variations in estimations may be as indicated in calibration and validation curves.



Performance

- The maturity index of *Dushehari*, an important variety of mango in India, measured with accuracy.

Impact and benefits

- Reduced post-harvest losses as the fruits can be harvested at correct maturity stage.

Manufacturer

- M/s Neotel Systems and Services SCO
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Contact

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Green Chilli Puree and Powder

Salient features

- The process involves destalking, washing, blanching (95°C for 4 minutes), crushing, pulping for puree making, pasteurization and bottling.
- The pasteurized pulp containing 16-18% total solids is termed as green chilli puree.
- The crushed green chilli is dried to 4% moisture content and pulverised.
- Green chillies have more Vitamin C and A and antioxidant properties.



Performance

- 120g green chilli powder and 300 ml puree can be prepared from one kg of fresh green chilli.

Cost

- The cost of processing 1,000 kg/day green chilli along with plant and machinery is ₹ 7,75,000.
- Considering the raw material cost of ₹ 15/kg of green chilli, the production cost of green chilli powder is ₹ 170/kg and cost of puree ₹ 60/ℓ



Impact and benefits

- Processing of green chilli into puree and powder will add 5-6 times value to the raw chilli. Therefore, it provides opportunity for employment generation.
- The products also have good export potential.

Manufacturer

- M/s Farm Green Company
17/41, Singhpura Mohalla Near, Jagraon
Bridge, Ludhiana 141001 (Punjab)
Tel.: 09417481091, 09779409450



Contact

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Dried Onion Flakes and Powder

Salient features

- Hot air drying is the most commonly used method to dehydrate food products. Dehydrated product can be used in dry soup mixes, canned soups and sauces, frozen entrees, processed meats, baby foods, snack foods and seasoning blends. Good packaging material will help to store the product up to 9 months safely.
- Onion flakes can be converted into powder for utilization in the different product preparations by using pulverizers/mixer/grinder.

Performance

- 100 kg of onion will yield about 14-16 kg of dried onion flakes and these can be rehydrated 30 min. prior to consumption.
- 50 kg sliced onion takes about 8-9h drying time in tray dryer and 16-18 h sunshine in greenhouse drying.



Cost

- Initial investment : ₹ 4 to 5 lakh for 100 kg fresh onion/day capacity
- Dried onion flakes : ₹ 200/kg
- Onion powder : ₹ 250/kg

Impact and benefits

- With growing incomes, changing lifestyles and hectic daily schedule, market for dehydrated onion is growing especially in urban areas.
- Dehydrated product can be used in dry soup mixes, canned soups and sauces, frozen entrees, processed meats, baby foods, snack foods and seasoning blends.

Manufacturers

- Mr Dilip B. Sangale Shedgaon, Ta: Sangamner, Dist: Ahamadnagar (Maharashtra) Tel.: 09822464949, 09326840691
- Mr Vijay U. Pankade E-90, Balaji Nagar, Aurangabad 431005 (Maharashtra) Tel.: 09822565171 E-mail: prashant_sangale@yahoo.com

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Coriander Dal Milling

Salient features

- A batch type method of production of coriander *dal* with capacity 2 tonnes/day has been standardized.
- This uses cylindrical or concave dehusker rather than hammer mill type to get better quality product.
- The method comprises cleaning, splitting and dehusking, grading, conditioning (8-10 h), polishing, brine treatment, sun drying (8-10 h), pan roasting, grading, mixing and packaging.

Performance

- Better shelling efficiency and minimum broken percentage and low power consumption.

Cost

- Unit cost : ₹ 2 lakh

Impact and benefits

- The process results in minimum broken (13%), earning higher profits for the farmer entrepreneur.
- Reduction in drudgery and enhancement in product recovery.
- Coriander *dal* (*dhania dal*) is mainly used as an adjunct in *supari* or *pan masala* and consumed as a digestive chew.

Manufacturer

- M/s Patidar Products
P. O. Matirala
Distt. Amreli 365430 Gujarat

Contact

AICRP on Post-Harvest Technology
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College of Agricultural Engineering and Technology
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Junagadh 362001 (Gujarat) Tel.: 0285-2672080-90 Ext 392
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Animal Feed from Potato Processing Waste

Salient features

- The process helps in using potato as a replacement of grain in animal feed pellets.
- Potato processing waste/surplus potatoes/ under or over-sized potatoes (up to 30%), maize, barley, DORB, mustard oil-cake, mineral mixture etc. are used.
- Size reduction of raw materials is done followed by blending, pelletizing, drying and packaging.
- The equipment such as hammer mill, ribbon blender, horizontal/vertical pelletizer, dryer etc. are required.



Cost

- Initial investment: ₹ 15,00,000 for 100 kg/h capacity plant

Impact and benefits

- The developed animal feed pellets with potato waste have following advantages:
 - ◆ rich in energy
 - ◆ utilizes potato-processing waste and surplus potatoes
 - ◆ reduces disposal problem
 - ◆ comparatively cheaper.
- Around 15% of the raw potatoes are generated as waste during potato processing. Potato processing waste, such as peel, pulp, potato culls, chips and fragments can be converted into animal feed thereby reducing the disposal problem of the waste.

Manufacturer

- Mr D.S. Oberoi 28-A, 41-A Dairy Complex
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Contact

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Banana Flour Biscuits

Salient features

- The product is rich in fibres and good for patients suffering from constipation.
- It is rich in minerals like potassium, phosphorus and calcium.
- Banana flour can be prepared from raw fruits which are unsuitable for fresh market and unmarketable surpluses.



Performance

- 100 kg per day (8 hours)

Cost

- ₹ 80 per kg of finished product

Impact and benefits

- It can provide good source of employment as well as backward support to farmers by providing remunerative price to the raw material.
- It can be adopted by small scale industries like bakeries and confectioners.

Manufacturer

- M/s Rural Organization and Awareness Development (ROAD)
26/30, Ramalingapuram Street, Ambasamdram,
Tirunelveli District 627425 (Tamil Nadu)

Contact

Director

National Research Centre for Banana

Thogamalai Road, Thayanur Post

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E-mail: nrcbdirector@gmail.com Website: www.nrcb.res.in

Banana Flour

Salient features

- Prepared from mature green bananas which have high starch content.
- It can be used as nutritious adjuvant in several food preparations like bread, cakes, biscuits, health drink, baby food and soup mix formulations.



Performance

- 30 kg per day (8 hours)

Cost

- ₹ 70 per kg

Impact and benefits

- The technology will help in generating additional income to farmers over the existing system of selling raw fruits as such.
- The technology will generate employment and income to the society.

Manufacturers

- Mrs N. Mary, Managing Trustee
M/s Rural Organization and Awareness Development (ROAD)
26/30, Ramalingapuram Street, Ambasamdran
Tirunelveli District 627425 Tamil Nadu
- M/s Dorven Agro Eco Bioventures Pvt. Ltd.
F-4 Surabi Homes Nehru Nagar, Chromepet
Chennai 600021 (Tamil Nadu)
- M/s Geetha Industries
501, Bansi Palace Jeyashree Nagar Junagadh 362041 (Gujarat)
- M/s Ansa Foods & Herbs No.14 Mission Hospital Road
Trichy 620003 (Tamil Nadu) Tel.: 09842472978
- M/s Green Plantation Foods Pvt. Ltd.
7/3, Middle Street Pirattiyur (P. O.)
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Contact

Director

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Tel.: 0431-2618106 Fax: 0431-2618115
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Website: www.nrcb.res.in

Finger Millet Biscuits

Salient features

- For increasing dietary fibre and micro/macronutrient availability in biscuits, 70% wheat flour has been substituted with finger millet flour.
- The developed product is rich in calcium.

Nutritive Value of Biscuits Prepared from 70% Finger Millet Flour (100g)

| S. No. | Nutrient | Finger millet biscuits | Wheat biscuits |
|--------|--------------|------------------------|----------------|
| 1 | Carbohydrate | 62 g | 62 g |
| 2 | Protein | 5.0 g | 6.0 g |
| 3 | Fat | 23 g | 23 g |
| 4 | Energy | 480 kcal | 480 kcal |
| 5 | Crude Fibre | 2.0 g | 1.0 g |
| 6 | Calcium | 130 mg | 50 mg |
| 7 | Iron | 6.5 mg | 4.5 mg |
| 8 | Zinc | 1.5 mg | 1.0 mg |



Impact and benefits

- Finger millet is equivalent rich in calcium. Hence, the biscuits prepared using finger millet are very nutritious and healthy.
- Good for anemic and diabetic people.

Manufacturer

- Chetna Bakeries, Patal Devi, Almora

Contact

Director
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Full Fat Soyflour Biscuits

Salient features

- Contain about 12% protein, 23% fat and 500 kcal/ 100 g. The product can be prepared in existing bakery facility of cottage to large scale.



Performance

- The process is easy to adopt and no change in equipment set-up is needed for production of soy-fortified biscuits.
- Input: 50 kg/day unit requires two persons and covered space of 5×4 m for bakery of cottage size
- Output capacity: 50 kg/day

Cost

- ₹ 1,00,000 for processing capacity of 50 kg/day.

Impact and benefits

- Process for soy fortified biscuits at small and medium entrepreneur level
- Good quality soy biscuits can be made available to the consumer
- Good quality soy biscuits with health benefits.

Manufacturer

- Transferred to over 1,500 upcoming entrepreneurs from different states through training and over 250 units have been established.

Contact

Director

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Pusa – Shakti (Quality Protein Maize Chatpati)

Salient features

- Pusa - Shakti is a ready-to-eat *namkeen* mixture made up of Quality Protein Maize, rice, bengal gram, groundnut, mustard oil, mix spices and condiments, salt, citric acid etc. It has specific features:
 - ◆ Zero trans fat
 - ◆ MSG free
 - ◆ Fibre rich
 - ◆ Cholesterol free
 - ◆ Protein of higher biological value
 - ◆ Enriched with vitamin A and E

Performance

- The product is well accepted by the people and has the shelf-life of six months.

Cost

- ₹ 6/pack of 35 g

Impact and benefits

- The product is made up of Quality Protein Maize having balanced amino acid composition.
- Increased participation of farmers and farm women for scientific cultivation for enhanced production of grain to fetch higher price.
- Higher returns to farmers owing to higher yield of farm produce at incentive price.
- Set-up of small scale industry in rural sector.
- Employment of youth and women under production unit.
- Employment of women under marketing division.
- Nutritional security to the consumers.

Manufacturer

- M/s Om Shakti Foods, Sujawalpur Chowk, Sakra Dholi, Muzaffarpur 843104 (Bihar) Tel.: 09470010071

Contact

Head

Department of Processing and Food Engineering
Rajendra Agricultural University Pusa, Samastipur 848125 (Bihar)
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Dilkhush (Quality Protein Maize Instant Kheer Mix)

Salient features

- Dilkhush *kheer* is an instant *kheer* mix made up of rice, milk powder, QPM, sugar, soybean, dry fruits, sago etc. It is
 - ◆ Low caloric *kheer*
 - ◆ High in calcium
 - ◆ Very low in fat
 - ◆ Easy to cook only with water
 - ◆ Ready in minutes (only 15-18 minutes are required)
 - ◆ Tasty, aromatic and nutritious



Performance

- The shelf-life of the product is six months.

Cost

- ₹ 25/pack of 125 g (4 serving)

Impact and benefits

- The product is made up of Quality Protein Maize having balanced amino acid composition. Increased participation of farmers and farm women for scientific cultivation for enhanced production of grain to fetch higher price.
- Higher return to farmers because of higher yield of farm produce at incentive price.
- Set-up of small scale industry in rural sector.
- Employment of youth and women under production unit.
- Employment of women under marketing division.
- Nutritional security to the consumers.

Manufacturer

- M/s Guru Kripa Foods
Ram Dayalu Nagar, Muzaffarpur 843115 (Bihar)
Mr Om Prakash Sharma, Mobile: 09939448005

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Value Added Fried Food Products from Cassava Composite Flour

Salient features

- Ten fried food products, viz. hot fries, hot sticks, sweet fries, sweet dimons, salty fries, salty delight, *murukku*, crisps, nutrichips (with egg) and nutrichips (without egg) were prepared and nutritive value assessed.
- The sweet products had sugar content 31-38% while the salty and hot fries 3-4%. The fat content in various products ranged from 15 to 26%, with the sweet fries retaining less oil (15-18%) when compared to the hot or salty fries. The crude protein content was generally in the range of 5-7%.
- The products like nutrichips or *murukku* had higher protein content (9-11%). Calcium content was very high for fried products in which bengal gram flour, and other ingredients like groundnut paste, sesame seeds, egg, cashewnut paste etc. were added (228-346 mg 100g), while for the sweet and salty fries, a low calcium content of 40-52 mg 100g was present.



Performance

- Fried food products from composite flour based on cassava had high nutritional and textural quality as well as longer shelf-life.

Cost

- Initial investment is ₹ 50, 000

Impact and benefits

- Upgradation of the socio-economic status of cassava farmers and expansion of cassava cultivation in the traditional States like Kerala and Tamil Nadu.
- Factory operations are likely to generate by-product @ 30 tonnes per year. The technology has also been developed for utilization of waste for making compound poultry feed.

Manufacturers

- M/s Highland Foods C/o ARD 112 Manalipuzha Ormachapuzha 676320 (Kerala) Tel.: 09961971249
- M/s Tierra Food India Pvt.Ltd Kinfra Food Processing Park Elamanoor, P.O. Adoor 691524 (Kerala) Tel.: 0484-2783028 Fax: 0484-2551460 E-mail: alex@tierra.in
- M/s Triums Exporters Pvt. Ltd. Kannamkulam Post, B P Angadi, Tirur 676102 Malappuram (Kerala) Tel.: 0494-2420438 E-mail: info@triumsexporters.com
- Mr. James Raj J. P. Bhavan, Kakkavila B. O. 695506 Thiruvananthapuram (Kerala) Tel.: 09947945847

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Osmotic Dehydration of Fruit and Vegetable Slices

Salient features

- Osmotically dehydrated products are shelf-stable and highly nutritious with good natural colour, flavour and texture.
- It involves dehydration of tropical fruit slices, viz. mango, pineapple, papaya, *aonla* banana, jackfruit, guava, and vegetables viz. carrot, pumpkin slices, in two stages.

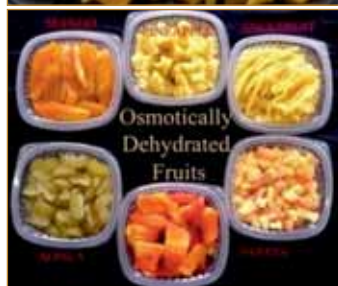


Performance

- Batch process capable of producing 100-200 kg products per day.

Cost

- Initial investment is ₹ 10,00,000
- Cost of product: ₹ 250-300/kg



Impact and benefits

- The process is simple and involves operations like selection of fruits, cleaning, washing, peeling, curing and slicing/dicing.
- Use of this process may improve the scope for better use of natural resources and also in reducing the post-harvest losses of these valued commodities. This is a highly nutritious product, suitable for domestic consumption and international trade.

Manufacturer

- M/s. Pee Pee Appliances Pvt Ltd
255, Mint Street, Sowcarpet, Chennai 600 079 (Tamil Nadu)
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E-mail: director@iihr.ernet.in

Ready-to-constitute Makhana Kheer Mix

Salient features

- With the intention of overcoming the problem of high transportation cost and to develop a product with high sensory acceptability, 'ready-to-constitute *makhana kheer* mix' has been developed.
- The grinding of *makhana* in developed process is done at normal room conditions without heating the *makhana*, whereas it is done after roasting the *makhana* in iron pan on fire in the conventional process.



Impact and benefits

- The developed process minimizes the energy consumption. Use of this mix for preparation of *makhana kheer* eliminates the cooking processes followed in the conventional household method.
- The developed ready-to-constitute *makhana kheer* mix has longer shelf-life and can be transported at much lower cost as compared to that of raw popped *makhana* to any where for marketing for better remuneration.
- It saves time and energy in preparation of *makhana kheer*.

Manufacturer

- M/s Vijay Raj & Company
Baheri Darbhanga 847105 (Bihar)
Tel.: 09431076985, 09472801632
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Proteino-H (Kadhi Mix)

Salient features

- Protein-H *kadhi* mix is an instant mixture made up of QPM, milk powder, lentil *dal*, soybean, sago, mustard oil, salt, mix of spices and condiments etc. It has:
 - ◆ Attractive colour
 - ◆ Good taste
 - ◆ High content of nutrients specially protein, vitamins and minerals
 - ◆ Good aroma
 - ◆ Easy-to-cook procedure (requires water only for cooking)
 - ◆ Low cost



Performance

- The shelf-life of the product is six months.

Cost

- ₹ 6/pack of 25 g (4 servings)

Impact and benefits

- The product is made up of Quality Protein Maize having balanced amino acid composition.
- Increased participation of farmers and farm women for scientific cultivation for enhanced production of grain to fetch higher price.
- Higher return to farmers owing to higher yield of farm produce at incentive price.
- Set-up of small scale industry in rural sector.
- Nutritional security to the consumers.

Manufacturer

- M/s Om Shakti Foods, Shujawalpur Chowk Dholi (Sakra),
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Soy Shrikhand

Salient features

- Soy *shrikhand* has been developed using sugar and curd prepared from soymilk.

Performance

- 25-50 kg soy *shrikhand* can be prepared per day.



Cost

- For yearly production of 12,500 kg soy *shrikhand* with 20% profit level, annual net profit is ₹ 1,39,250 at a selling price of ₹ 64/kg.

Impact and benefits

- Nutritious and low cost soy *shrikhand* can be made available to the actual consumers.
- Health benefits to consumers.

Manufacturer

- Sangram Soyfoods (Prop. Shri Eknath Dhamdhare)
Mundhawa, Pune (Maharashtra)

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Soy Sattu

Salient features

- Soy *sattu* is prepared by incorporating soybean, cereal and bengal gram. This highly nutritious and comparatively low cost *sattu* may be served to highly malnourished population.



Performance

- 25-50 kg soy *sattu* can be prepared per day.

Cost

- ₹ 1,49,712/ year
- Total production : 6,250kg/year
- Net profit/year : ₹ 37,438

Impact and benefits

- Process for making soy *sattu* can be easily adopted by small scale entrepreneurs.
- Highly nutritious and low cost soy *sattu* can be made available to the actual consumers.
- Health benefits to consumers.

Manufacturers

- Sangram Soyfoods (Prop. Shri Eknath Dhamdhare)
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Process for Pusa Soy Nut

Salient features

- The soy nut is a crunchy ready-to-eat product.
- The product is rich in protein and fat.
- The product has high content of antioxidants and flavonoid and is rich in micronutrients, viz. Ca and Fe.
- The product is free from any kind of chemical preservative.
- The anti-nutritional factor like trypsin inhibitor activity (TIA) has been reduced by 90%.



Cost

- For about 20 kg/day, initial total investment will be about ₹ 5,50,000 and unit product cost will be approx. 160/kg.
- Break even production has been estimated as 29% of the installed capacity.

Impact and benefits

- This could easily be adopted as small scale business with good profit margin.
- Additionally, the product could help in achieving nutritional security.
- Approximately net income of ₹ 6,00,000/annum can be generated.

Manufacturers

- Pravin Reinforced Plastics Pvt. Ltd., D-111 B. S. Road, Industrial Area Ghaziabad 201009 (Uttar Pradesh)
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Soymilk and Soypaneer (Tofu)

Salient features

- Healthy alternative to dairy mil.

Performance

- Input: 35 kg soybean per day; machinery: two skilled workers. Covered space of 5×4 m for the installation of machinery and storage of raw materials as well as products.
- Output capacity: 200 litres soymilk or 50 kg soypaneer/day for small scale enterprise, with 300 days of operation in a year, net earning of ₹ 20,000 per month is possible



Cost

- Capital investment ₹ 3,00,000 for machine processing 200 litres soymilk/day or 50 kg soypaneer/day unit

Impact and benefits

- Good quality soy milk and tofu can be made available to the consumer at lower cost as compared to dairy products.
- Health benefits to consumers.

Manufacturer

- Transferred to over 1500 upcoming entrepreneurs from different states through training and over 250 units have been established.

Contact

Director

Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2737191, Fax: 0755-2734016
Email: director@ciae.res.in

Groundnut Beverage, Curd and Paneer

Salient features

- The process involves the deskinning of groundnut, steaming, soaking in water, grinding with hot water, filtration and homogenization. Flavour is added after cooling and groundnut flavoured beverage is ready for bottling.
- Groundnut *paneer* development involves boiling of groundnut milk followed by coagulation, filtration through double layer muslin cloth, hanging for separation of whey, pressing using *paneer* press machine and then cutting into desired cube size.



Performance

- One kg groundnut kernel will produce 7 litre groundnut milk. Similarly one kg groundnut kernel can be converted into one kg *paneer*. Twenty per cent of okra left during process can be dried and utilized in different sweets.

Cost

- Total cost per annum is ₹ 17, 01,131 which includes fixed and working cost.
- This will result in net profit of ₹ 5, 85,369 per annum in the subsequent years.
- Benefit : cost ratio : 1.35; Pay-back period : 1.85 years.

Impact and benefits

- Generates income and employment for the entrepreneurs and associated rural population.
- Developed products play an important role in combating malnutrition.

Manufacturers

- Krishna Oil and Dhal Mill, Dausa 303303 (Rajasthan)
Tel.: 09413847850
- Symphony Trade Com, Raipur 492001 (Chhattisgarh)
Tel.: 09300225562 E-mail: gshadija@rediffmail.com

- Geeta Industries, G.I.D.C-II, Plot No. 1889 Junagadh 362003 (Gujarat)
Tel.: 0285-2636604 E-mail: vspiyush@gmail.com
- Mr Gaurav Modi, Modi House Telepada Morena 476001 (Madhya Pradesh)
Tel.: 09907499848 E-mail: gauravmodi2001@gmail.com
- Satyam Mahajan, Nutan Nagar
Khargone 464671 (Madhya Pradesh)
Tel.: 07282-231640 E-mail: satyammahajan@yahoo.com
- Bala Jee Agro Foods Bareilly 243001 (Uttar Pradesh)
Tel.: 09627045052 E-mail: agroproducts.bansal@gmail.com
- Soya Health Foods 70, Kamla Nehru Colony, Bathinda 151001 (Punjab)
Tel.: 09815703459

Contact

Director

Central Institute of Post-Harvest Engineering and Technology
P.O. PAU Campus, Ludhiana 141004 (Punjab)
Tel.: 0161-2313101 Fax: 0161-2308670
E-mail: ciphet.director@gmail.com

Pickled Quail Eggs

Salient features

- A simple, cost-effective technology has been developed for pickling of quail eggs for storage/marketing at ambient temperature in ready-to-eat form.
- The process can be easily practiced in rural areas without much investment and skill.



Performance

- The product can be safely stored for 4 months at ambient temperature (25-30°C) and can find place in fast-food outlets including children mid-day meal scheme.
- No refrigeration required during transportation and distribution.
- Labour requirement will vary with the number of eggs pickled.
- One labour will process 1,000-1,500 quail eggs in 8 working hours.

Cost

- Ingredient cost of producing a packet of 10 pickled quail eggs in HDPE (300 gauge) pouch is ₹ 15/packet.

Impact and benefits

- Rural and unskilled labourers can supplement their income through this technology.
- Supplemented income will help in uplifting social status of the processors.

Manufacturer

- M/s JST Poultry Pvt. Ltd.
Vill. Pajaniya, Block Nourpur, Distt. Bijnor 246761 (Uttar Pradesh)

Contact

Head
Division of Post-Harvest Technology
Central Avian Research Institute
Izatnagar, Bareilly 243122 (Uttar Pradesh)
Tel.: 0581-2301261 Fax: 0581-2301321
E-mail: cari_director@rediffmail.com

Chicken Gizzard Pickle

Salient features

- Mustard oil based as well as vinegar based chicken gizzard pickles are low cost, low caloric, protein rich, consumer friendly chicken fast food. Technologies to prepare gizzard pickles have been based on the minimal use of preservatives.



Performance

- Product can be stored at room temperature (Max. 34°C) for 45 days during summer/rainy season, and 75 days during winter season (Max. 26°C).

Cost

- ₹ 80 (Vinegar based) to ₹ 100 (Mustard oil based) per kg at laboratory scale. Cost may vary with the prevailing market rates of inputs used.

Impact and benefits

- Rural households can also prepare gizzard pickles with common household utensils and without electricity.
- This is a simple technology which can be used by unskilled manpower.
- Increase in income can help in uplifting social and financial status of the processors with availability of proteinaceous fast food to the consumers.

Manufacturer

- M/s JST Poultry Pvt. Ltd.
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Contact

Head

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Cooked Chicken Stock (One Minute Curried Chicken)

Salient features

- This is a cost-effective fast food for instant use by working couples, old people and highly useful at times of instant need. Curried chicken can be instantly availed by mixing the contents (cooked chicken stock) with boiled hot water and further boiling the mix for one minute.



Performance

- Packed product can be safely stored till 4 weeks under frozen ($-18 \pm 1^{\circ}\text{C}$) and for 2 weeks under refrigeration ($4 \pm 1^{\circ}\text{C}$).

Cost

- ₹ 220/ kg at laboratory scale; cost may vary with the prevailing market rates of inputs used.

Impact and benefits

- Rural households can also prepare this product with minimum fiscal investment.
- This is a simple technology which can be used by unskilled population. Supplementary income could help in uplifting financial status of the processors.

Manufacturer

- M/s JST Poultry Pvt. Ltd.
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Contact

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Mixed Chicken Loaf

Salient features

- This technology offers relatively moderate cost, easy to process and cost-effective fast food. The preparation is based on the use of processed vegetable proteins intended to reduce the cost of production without compromising nutritive values of the product.



Performance

- Raw product can be safely stored up to 150 days at freezing temperature ($-18 \pm 1^\circ\text{C}$).

Cost

- Production cost of product is ₹ 280/ kg at laboratory scale. Cost may vary with the prevailing market rates of inputs used.

Impact and benefits

- This is a simple technology which can be used by unskilled, uneducated people including housewives.
- Supplementary income could help in uplifting financial and social status of the processors.
- Such cut cost technology offers about 25% additional monetary gains to the processors/entrepreneurs.

Manufacturer

- M/s JST Poultry Pvt. Ltd.
Vill. Paijaniya, Block Nourpur, Distt. Bijnor 246761 (Uttar Pradesh)

Contact

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Central Avian Research Institute
Izatnagar, Bareilly 243122 (Uttar Pradesh)
Tel.: 0581-2301261 Fax: 0581-2301321
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Cooked Chicken Roll

Salient features

- Cooked chicken roll is a novel, ready-to-consume fast food requiring mild warming before use. It can be easily utilized like biscuits under coverage of aluminium foil capable of conducting warmth to the product when heated under unexposed conditions.



Performance

- The product can be safely stored till 4 weeks under freezing temperature (-18°C) and for 2 weeks when kept under refrigeration ($4 \pm 1^{\circ}\text{C}$).

Cost

- Investment requirements are minimum and that too for hot air oven, pressure cookers etc.
- Product can be prepared @ ₹ 280/kg at laboratory scale. Cost may vary with the prevailing market rates of inputs used.

Impact and benefits

- This is a simple technology which can be used even by unskilled persons.
- Supplementary income could help in uplifting financial status of the processors.
- Such cut cost technology offers about 10% additional gains to the processors/entrepreneurs.

Manufacturer

- M/s JST Poultry Pvt. Ltd.
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Functional Chicken Nuggets

Salient features

- It is a ready-to-eat chicken meat product with 50% less sodium chloride and 35% less fat (unsaturated) than the traditional product. There is utilization of spent hen meat and incorporation of dietary fibre in the product.



Performance

- Product has indigenous flavour profile along with refrigerated ($4\pm^{\circ}\text{C}$) shelf-life of about 3 weeks and frozen ($-18\pm 1^{\circ}\text{C}$) shelf-life of about 3 months.

Cost

- The technology is available at ₹ 20,000 per lump sum per entrepreneur on non-exclusive basis.

Impact and benefits

- The technology is easily adoptable by small and medium entrepreneurs.
- The consumption of this product will help in prevention of obesity, hypertension and improves bowel movement.

Manufacturer

- M/s Anshika Enterprise
C/o Parmendra Massey, At Baby Fold, Civil Lines,
Bareilly 243001 (Uttar Pradesh) Mobile : 094124 62853
E-mail: dmasseyparmendra@gmail.com

Contact

Director

Indian Veterinary Research Institute
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E-mail: dirivri@ivri.res.in

TANUVAS Chicken Patties and Sausage

Salient features

- Comminuted coarse ground meat/emulsion based meat products utilizing broiler/spent hen meat.
- The product has been customised to meet the demands and culinary preferences of India.

Cost

- Product cost : ₹ 300/kg

Impact and benefits

- Value addition.
- Enhanced meat demand.
- It will provide variety to the consumer and thus will increase the demand for meat.
- Ready-to-eat product and is very suitable for today's fast paced lifestyle and for the working women.

Manufacturer

- Regularly marketed through the sales counter of the Department of Meat Science and Technology, Madras Veterinary College, Chennai 600007 (Tamil Nadu)

Contact

Department of Meat Science and Technology
AICRP on PHT (TANUVAS Centre)
Madras Veterinary College, Chennai 600007 (Tamil Nadu)
Tel.: 044 -2530 4077 Fax- 044- 2536 2787
E-mail: hodmstmvc@tanuvas.org.in

Value-added Products from Fish

Salient features

- Value-added products are prepared either from dressed fish or from fish mince. These products can be made on small scale with minimum equipment or can be manufactured industrially with the help of sophisticated machineries.



Performance

- It adds value to the tune of 100-300% depending upon the type of the products.



Cost

- ₹ 2,00,000 for SHG's limited to 3 products
- ₹ 3,00,000 for large scale with 2 tonnes capacity.

Impact and benefits

- Conventional system of utilization of fish in domestic sector is limited to the sale of fresh fish. Value addition of fish enables the producer/processor to increase the margin of profit.
- Complete utilization of the resources with zero wastage.



Manufacturers

- Himalayan Fisheries
216, Vishwadeep Building, District Centre, Janakpuri, New Delhi.
- Matasaya Bhawan
Directorate of Fisheries, Bilaspur 174001 (Himachal Pradesh)
Tel.: 01978-224068
- Aryad and Kanjikuzhi Block Panchayat
S.N. Puram P.O. Alappuzha 688528 (Kerala) Tel.: 0478-2862373
- Gandhi Smaraka Seva Kendram-Alappuzha.
S.L. Puram P.O. Alappuzha 688523 (Kerala) Tel.: 0478-2865493

Contact

Director

Central Institute of Fisheries Technology
CIFT Junction, Matsayapuri P. O. Cochin 682029 (Kerala)
Tel.: 0484-2666845 0484-2668212
E-mail: enk_ciftaris@sancharnet.in

Ready-to-Serve Fish Curry

Salient features

- (a) Equipment and facilities required:
 - Over pressure retort with accessories
 - Temperature recorder
 - Sealing machine and minor equipments. Space requirement including built up area– 400 m²
- (b) Raw materials – Fish and other ingredients
- (c) Man power
 - Women labour – 20 Nos.
 - Men – 3 Nos.
 - Supervisor – 1 No.
 - Driver – 1 No.
 - Technologist – 1 No.



Performance

- Output capacity of commercial product : 3000 pouches/day (8 h)

Cost

- Cost of production : ₹ 30/pouch at 100 % capacity
- Expected selling price : ₹ 40/pouch
- Expected sale : ₹ 1,20,000/day at 100% capacity
- Net profit : ₹ 30,264.21/day at 100% capacity
- Net profit ratio : 25.22%
- Rate of return : 38% (Considering production for 3 years)

Impact and benefits

- Suitable for different varieties of fish and also for other food products.
- Owing to high surface area to volume ratio, faster heat transfer to the cold point is possible. Thus processing time is reduced and sterility is achieved with improved flavour, colour and texture compared to the products packed in metal cans.

Manufacturers

- Forstar Frozen Foods Pvt. Ltd., M53 MIDC Industrial Area, Tuloja, New Mumbai 410208 (Maharashtra) Tel.: 022-27401073, 27410807
- Sara Spices, Kizhakkambalam, Aluva, Kochi 683562 (Kerala) Tel.: 0484-2680700
- Britto Exports, No. 9, 3rd Lane, GA Road, Old Washermanpet, Chennai 600021 (Tamil Nadu) Tel.: 044-25955354
- Anns House of Sweets, Ketheedral Church Road, Pala, Kottayam 686575 (Kerala) Tel.: 04822-215967, 213193

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E-mail: enk_ciftaris@sancharnet.in

Low Lift Hand Pump (Manual)

Salient features

- Suitable to lift water from river, pond canal, open well, tube wells and shallow depressions. It can lift water up to 6 m height.



Performance

- Operating force : 3-5 kgf
- Capacity : 3,500- 4,500 l/h

Cost

- Unit cost : ₹ 4,500

Impact and benefits

- Saving in cost of operation.

Manufacturers

- M/s Batala Engineering Works
Hirapur Road Sarvodaya Colony, Telibandha, Raipur 492099
(Chhattisgarh)
Tel.: 0771-6065555 E-mail: batalaengg@gmail.com
- M/s Dandekar Fabricator, Near High school
Tamaseoni, Arang, Raipur 493661 (Chhattisgarh)
Tel.: 09754956717

Contact

Dean
College of Agricultural Engineering
Indira Gandhi Krishi Vishwavidyalaya
Raipur 492006 (Chhattisgarh)
Tel.: 0771-2102575 Fax: 0771-2442131, 2442302

Multipurpose Poly House Solar Dryer

Salient features

- Poly house can be used for drying of agricultural produce. Ventilators are to be provided for removal of excess moisture.
- Size of poly house : 12×8×2.5 m
- Number of ventilators : 24
- Total area of trays : 200 m²



Performance

- Capacity of the dryer : 2 tonnes/batch (Chillies)
- Drying time : 6-7 days
- Drying temp : 45-56°C

Cost

- Unit cost : ₹ 1,14,000

Impact and benefits

- Dries the chillies in clean environment inside the poly house. Contamination causing agents like fungi, dust, dirt is avoided.

Manufacturers

- M/s Arfa Agro Products
D-No:25-11-31, G.T. Road, Guntur 522004 Andhra Pradesh
Tel.: 08643-5534386
- M/s Hytas Corporation
3-6-295F2, Pioneer Chambers, Hyderguda, Hyderabad 500029 (Andhra Pradesh)
Tel.: 040-65226330

Contact

Head

Post Harvest Technology Centre

Agricultural College Campus

Bapatla, Guntur (Dist) 522101 (Andhra Pradesh)

Telefax: +91-8643-225180

E-mail: phtcbapatla@gmail.com, phtc_bapatla@rediffmail.com

Solar Tunnel Dryer (One-tonne and Two-tonne capacity)

Salient features

- Solar tunnel dryer (poly house dryer) consists of a tunnel type semi-cylindrical drying chamber provided with windows to allow the ambient air to enter the dryer. Trolleys and trays are provided to hold one tonne and two tonnes of raw material.



Performance

- Capacity : 1 -2 tonnes/ batch

Cost

- Unit cost : ₹ 1.5 lakh for 1-tonne capacity
: ₹ 2.0 lakh for 2-tonne capacity
- Cost of operation : ₹ 225 per quintal for drying chilli

Impact and benefits

- Reduced post-harvest losses
- Saving in drying time
- Saving in labour
- Contamination free product
- Higher market value through colour retention
- Increased profit.

Manufacturer

- M/s Nikoil Filtration System
M-3, KSSIDC, Industrial Area, Hyderabad Road,
Raichur 584101 (Karnataka)
Tel.: 09448815812, E-mail: nfs.ravindra@yahoo.com

Contact

Research Engineer
AICRP on Post Harvest Technology
Department of Processing and Food Engineering
College of Agricultural Engineering
University of Agricultural Sciences, Raichur (Karnataka)
Tel.: 08532 221577
E-mail: udaykumarnidoni@yahoo.co.in

Walk in Type Solar Tunnel Drier

Salient features

- Consists of semi-cylindrical tunnel structure with hoops and laterals laid in East–West direction to capture maximum solar energy.
- Structure is covered with UV stabilized polyethylene sheet of 200 micron thickness as solar collector material. Solar radiation is transmitted through UV film to tunnel chamber.
- Absorber surface is made up of cement concrete floor laid at a gradient of 50 along the length and coated with special black paint to increase the solar absorptivity.
- Size of dryer varies depending upon the capacity. An overall size of a typical 1.0 tonne/batch capacity solar tunnel dryer is 18.0 m × 3.75 m × 2.0 m.
- Size of air inlet ports. Number of chimneys and exhaust fans varies depending upon capacity of dryer.
- An auto on-off exhaust fan equipped with temperature and relative humidity sensors is used as temperature controller.



Performance

- 15-20°C increase in temperature above ambient temperature inside the tunnel.
- Drying time required to dry 4,500-5,000 de-husked splitted copra nuts/batch having initial moisture content of 55% to 6-7% final moisture content is 24 h as compared to 40 h in open sun drying.
- Reduction in labour cost was found to be about 15% in copra drying.

Cost

- Initial cost of 1.0 tonne capacity typical solar tunnel drier works out to be ₹ 1,48,000.
- The cost/m² area works out to be ₹ 2,193.

Impact and benefits

- Farmers can get higher price of their dried product owing to better quality as compared to open sun drying.
- Drying period is reduced from 40 h to 24 h in case of copra.
- There is 15% saving in labour cost over conventional system of open sun drying.

- Sale of dried produce leads to better socio-economic status of farmers and produce is dried without using any fossil based fuel or electrical energy, so there is no addition of pollution in environment.

Manufacturers

- M/s Libra Innovations Pvt. Ltd.
276/1, Anjaneyar Koil Street
Vengaivasal, Chennai 600126 (Tamil Nadu)
- M/s Reny Agro and Engg. Pvt. Ltd.
338/3C3, Ellai Thottam Road Extension
Shri Venkateswara Industrial Estate
Peelamedu, Coimbatore 641004 (Tamil Nadu)
- M/s Unique Fabricators
10/3, Athipalayam Road
Chinnavedampatty, Coimbatore 641006 (Tamil Nadu)
- M/s Matri Kirpa Engineering and Welding works
388, Hiran Magri, Near Post Office, Sector 4, Udaipur 313001 (Rajasthan)
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Head, Bio-Energy Department
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Tamil Nadu Agricultural University, Coimbatore 641003 (Tamil Nadu)
Tel.: 0422-6611276 Fax: 0422-6611455
E-mail: bioenergy@tnau.ac.in

Packed Bed Solar Air Heater/Dryer

Salient features

- Flat plate or packed bed with single glazing or unglazed collector air heaters can be used based on capacity, space availability, etc. for drying purposes.
- Solar air heater can be retrofitted with existing dryers.
- An electrical blower of adequate capacity is used to circulate air in the solar air heater.
- Appropriate biomass/LPG/NG, etc. based back-up is provided with these dryers.
- Suitable for drying of agro products such as Potato chips, Ginger, Mango, Mushroom, Chilli, etc.



Performance

- Loading capacity may vary from 15 kg to 1 tonne/batch.
- Drying efficiency ranges between 30 and 50 %.

Cost

- Initial cost is approximately ₹ 11,000/m²

Impact and benefits

- The main advantages of this solar drying system are that dried product retains original colour of the product to a large extent and the final product is not contaminated by dust, dirt or impurities. Farmers can get the better economic return owing better quality of dried product as compared to open sun dried produce.
- Sale of dried produce leads to better socio-economic status of farmers and produce is dried without using any fossil based fuel or electrical energy so there is no addition of pollution in environment.

Manufacturer

- M/s Warm Stream
Post Box No.22, Anand-Sojitra Road
Vitthal Udyognagar, Anand 388121 (Gujarat)
Tel.: 02692-2313116, 232309
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- M/s Steelhacks Industries
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- M/s NRG Technologies Pvt. Ltd.
989/6, G.I.D.C. Makarpura
Vadodara 390010 (Gujarat)
Tel.: 0265-2642094
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- M/s Electrotherm Solar Limited
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E-mail: info@spreri.org

Solar Tent Dryer

Salient features

- Small, portable, low cost dryer for domestic applications.
- Glazing with industrial PVC sheet of 100 micron thickness.
- Works on natural convection.
- Product quality is better than open sun dried product.
- Easier loading, unloading and handling.



Performance

- Loading capacity ranges from 0.5 to 1 kg/batch for domestic applications.
- Drying efficiency varies between 18 and 25%.
- Drying time per batch varies from 1 to 1.5 days depending upon the product.

Cost

- ₹ 800

Impact and benefits

- Farmers can hygienically dry locally available seasonal products and store those for subsequent uses.
- Nutritious low cost food may be available to the farmers throughout the year. Sale of dried produce may lead to better socio-economic status of farmers and produce is dried without using any fossil based fuel or electrical energy, so there is no addition of pollution in environment.

Manufacturer

- M/s Rural Engineering School
At. Rojmal, Ta. Gadhada (SWA)
Dist. Bhavnagar 364750 (Gujarat)
Tel.: 02847-244127 E-mail: manishpancholi72@gmail.com

Contact

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Solar PV Refrigerator

Salient features

- Top opening vapour compression refrigerator equipped with Danfoss, 60 W, BD 35 F compressor.
- Insulation is provided with 70 mm thick polyurethane foam.
- Dimension (h×w×d) is 790×590×590 mm.
- Weight of refrigerator is 45 kg.
- Operating voltage is 12 V/24 V DC
- Energy consumption varies between 500 and 600 Wh/day
- Cool chamber temperature ranges between (-) 3 and 6°C
- Seven thermostat settings are possible.



Performance

- Loading capacity : 80 to 200 l

Cost

- Total cost of the unit including imported DC compressor, solar PV modules, battery bank etc. is ₹ 1, 00,000 per unit.
- Operating cost is negligible. However, battery bank requires replacement after about 5 to 7 years interval (major cost involved).

Impact and benefits

- Useful for un-electrified rural areas to store essential items like animal vaccines, medicines, food products, etc.
- It will ensure local availability of items like life-saving medicines, animal vaccines, food products, etc.

Manufacturer

- M/s Sunrise Technologies
A/38, Electronic Zone, Sector-25, GIDC, Gandhinagar 382028 (Gujarat)
Tel.: 079-23287265, Fax: 079-23287263
E-mail: info@sunrisetechnologyinc.com
- M/s Mamta Energy Private Limited
Plot No. 858 Kothari Industrial Estate, Behind Hutch Tower
Rakanpur-Santej Road, Santej 382721 (Gujarat)
Tel.: 02764-324984, E-mail: sid@mamataenergy.biz

Contact

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Tel.: 02692-231332, 235011 Fax: 02692-237982

E-mail: info@spreri.org

Low Height Tunnel Solar Dryer

Salient features

- Modular semi-continuous type dryer and produce is not directly exposed to sun.
- Inner and outer body is made up of GI sheet duly painted with aluminium paint from all sides.
- Toughened glass is used as cover material to avoid breakage.
- Absorber is black painted GI sheet located @ 10° inclination.
- Drying chamber is located below the air heating unit, facilitated with track for rolling the trays one by one.
- Trays made up of SS 304 perforated sheet and are easily loaded into the dryer.
- Insulation is provided using 50 mm thick glass wool at bottom and two sides.
- Air flow is through AC driven exhaust fan with low capacity motor at delivery section.



Performance

- Loading capacity may vary from 15 kg to 2 tonne per batch depending upon the size of dryer.
- Drying efficiency ranges between 30 and 50%.

Cost

- Initial cost is around : ₹ 12,000/m².

Impact and benefits

- Farmers can get the better economic return owing to better quality of dried product as compared to open sun dried produce. Also operational cost is lower than that of conventional fuel based drying system.
- Sale of dried produce leads to better socio-economic status of farmers and produce is dried without using any fossil based fuel or electrical energy, so there is no addition of pollution in environment.

Manufacturer

- M/s Warm Stream
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Double Reflector Solar Cooker

Salient features

- Dimension of the box type solar cooker is $0.6\text{ m} \times 0.6\text{ m} \times 0.25\text{ m}$.
- The cooker is provided with double mirror reflector to increase solar heat input and save cooking time.
- The non-breakable acrylic mirror is provided with cooker to avoid breakage of mirror frequently.
- There are four cooking pots provided to keep food item for cooking.
- As compared to conventional box type cooker with single mirror reflector.



Performance

- The solar cooker is suitable for cooking food for 4-5 members.
- The cooking time for rice and pulses varied between 1.5 and 2.0 h.
- It reduces cooking time by 15-20% as compared to single reflector type cooker.
- It is more effective during winter months.

Cost

- Initial investment per unit works out to be ₹ 3000
- Operating cost (only for maintenance) is ₹ 50/y

Impact and benefits

- The yearly saving by use of solar cooker is about 100 kg wood/animal dung fuel worth ₹ 500 per year or 30 litres kerosene worth ₹ 600 or 30 kg LPG worth ₹ 900 per year.
- The saving of wood/cow-dung cake checks deforestation and organic manure for soil conditioning.
- Since it saves fossil fuels like LPG/kerosene there is no addition of carbon dioxide in environment.

Manufacturer

- M/s Hinglose Energy System
Govindpura, Bhopal (Madhya Pradesh)

Contact

Director

Central Institute of Agricultural Engineering
Nabi Bagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)

Tel.: 0755-252 2521133 Fax: 0755-2734016

E-mail: director@ciae.res.in

Solar Cocoon Stifler

Salient features

- The stifler is covered with transparent double glass cover of 2.0 m² solar collector area to enter sun light and prevent heat losses.
- Five step type trays are equipped with stifler to load the raw cocoons.
- Ten kg raw cocoon can be loaded in a batch.
- Electrical back up of 2 kW capacity with thermostat control is provided with the stifler to supplement heat during cloudy and inclement weather.
- A window with shutter is provided at the back of the stifler box to facilitate exit of moist air during stifling.



Performance

- The stifling capacity of the solar stifler is 50-60 kg raw cocoons per day (in 5-6 batches) during summer months and 30-40 kg per day during autumn and winter months.
- The stifling time per batch varies from 1 to 2 h depending upon the intensity of the sun.
- The average stagnant temperature during stifling varies between 65°C and 90°C.
- Silk quantity and strength of the solar stifled cocoon is at par with the cocoon stifled in the conventional electric oven.

Cost

- Initial investment per unit works out to be ₹ 25000.
- Operating cost of cocoon stifling works out to be ₹ 1.0/kg as compared to ₹ 1.40/kg in case of stifling using electrical oven.

Impact and benefits

- By use of the solar stifler, saving of electrical energy up to 475 kWh/year can be achieved.
- Solar energy is pollution free.

Manufacturer

- Shree Manak Industries
70B, Sec. H, Industrial Area Govindpura
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683

Contact

Director

Central Institute of Agricultural Engineering,
Nabibagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-252 2521133 Fax: 0755-2734016
E-mail: director@ciae.res.in

Solar Cabinet Dryer

Salient features

- The solar cabinet dryer is a simple natural convection type dryer.
- Capacity of the cabinet dryer is about 20 kg/batch.
- It is covered with plane glass (4 mm thick).
- The solar collector area of the dryer is 2.5 m².
- It is provided with 4 trays (0.5 m² area) having perforations at bottom to load the product.
- The hot air passes across the crop spread in a thin layer on trays in the drying cabinet.
- It is provided with an aspirator to facilitate exit of the moist air from the dryer.



Performance

- Drying time of the cauliflower and *aonla* fruits was reduced by 4-5 days as compared to 8-10 days in open sun drying.
- In general, drying time reduces by 40-50% and microbial counts by 3-4 times as compared to open sun dried product.

Cost

- Initial investment works out to be ₹ 25,000.
- Drying cost of the product: ₹ 8-10/kg of the dried product.

Impact and benefits

- Quality of the dried product improves and sale price increases by about 15% as compared to open sun dried product.
- The solar dryer can save electricity to the tune of 1.5-2.0 kWh/kg dried produce worth ₹ 10/kg as compared to electrical dryer.
- Solar energy is pollution free.

Manufacturer

- Shree Manak Industries
70B, Sec. H, Industrial Area Govindpura
Bhopal 462023 (Madhya Pradesh)
Tel.: 0755-2581683

Contact

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Nabibagh, Berasia Road, Bhopal 462038 (Madhya Pradesh)
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Large Capacity Fixed Dome High TSC Animal Dung Based Biogas Plants

Salient features

- The designs are available for 20-100 m³/day capacity for animal dung substrate.
- The plant design has been approved by MNRE and has been included in their incentive programmes.
- The digester of the plant is well shaped whereas gas storage is in fixed dome.
- Plant dimensions depend upon the size of plant.
- The influent inlet is through a 30 cm diameter rigid PVC pipe fixed with digester at an angle of 70°.
- The plant is operated under mesophilic temperatures efficiently.
- Since the influent contains high total solids concentration (TSC) in the range of 16-18% (wb), the effluent handling problem is eliminated to greater extent.
- As gas is stored in fixed dome made up of brick masonry, maintenance cost becomes almost negligible.
- Even non-functional floating drum biogas plants could be made functional by converting them into fixed dome structure.



Performance

- The capacity of plant may vary from 20 to 100 m³/day depending upon the need.

Cost

- Initial cost of installation of the plant is ₹ 8,000 per m³ capacity. The cost is reduced significantly with increase in size of plant.

Impact and benefits

- More than 250 units of developed technology having varying capacity in the range of 20-100 m³/day have been installed especially in Punjab at Dairy farms. Majority of units are coupled with electricity generating units using biogas as fuel. Thus the electrical energy demand from grid was reduced to these dairies.

- The developed technology eliminates the problem of slurry handling and management to greater extent. Animal dung is converted into gas and additionally nutritionally enriched manure is achieved. There is no emission of methane from dung to environment.

Manufacturer

- The developed technology has not been given to any one as such but design details have been provided to many needy individuals on their demand.

Contact

Director
School of Energy Studies
Punjab Agricultural University, Ludhiana 141004 (Punjab)
Tel.: 0161-2405655 Fax: 0161-2408684
E-mail: hodsesa@pau.edu

SPRERI Domestic Cook Stove

Salient features

- It is portable, primarily designed for operation in batch mode.
- Main shell is made of MS sheet and provided with 25 mm thick ceramic lining for insulation for service-free long life.
- Primary air supply may be regulated by a lever to get high performance under varying operating conditions.
- Weight of cook stove is 15.5 kg.
- Overall Dimension of cook stove is 330×345 ×295 mm (h×w×b).
- Fuel wood pieces, biomass briquettes or woody agro-residues having diameter in the range of 10-35 mm and length in the range of 25-60 mm are recommended as fuel for better efficiency of device.
- Moisture content of the fuel should preferably be less than 8 % (w.b.).



Performance

- Fuel burning rate is 1.5 kg/h
- Thermal efficiency of device is 27.4 %.
- Power rating is 1.9 kWth.

Cost

- Approx : ₹ 1,000/unit

Impact and benefits

- Fuel and cooking time saving to the tune of 20-50% and 30-40%, respectively, in cooking time as compared to conventional 'C' type *chulha* could be achieved.
- Device is convenient in operation and smoke emission is much less as compared to conventional *chulha*. There is 30-40% saving in cooking time which could be utilized to perform other jobs.

Manufacturer

- M/s Patel Trunk Factory
Vraj, Gandhi Road, Anand 388001 (Gujarat)
Tel.: 02692-241759 E-mail: shaswat712@gmail.com

Contact

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Vallabh Vidhyanagar 388120 Gujarat
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Coconut Tree Climber

Salient features

- The ergo refined coconut tree climbing device consists of an upper frame and a lower frame which are alternatively raised by the user to attain a desired elevation in coconut tree. The worker can work around the trunk of the palm for complete access.

Dimension (l×w×h) : 1,030×520×730 mm

Weight : 13.7 kg

Power requirement : one person



Performance

- A person can climb 5 to 13 coconut trees and harvest 56 coconuts per hour as against 28 coconuts per hour in traditional system.

Cost

- Unit cost : ₹ 4,000
- Cost of operation : ₹ 0.75/nut

Impact and benefits

- 38% saving in time and 48% in cost.
- Reduces drudgery by 68 % (calculated from cardiac cost).
- Unskilled plantation worker can climb the coconut tree.
- Protects the worker from occupational dermatitis.

Manufacturers

- M/s ACN Industries
231, Sangapur Road, Opp. Roots Industries
Ganapathy, Coimbatore 641006 (Tamil Nadu)
Tel.: 09360355333

Contact

Project Coordinator
AICRP on Ergonomics and Safety in Agriculture
Central Institute of Agricultural Engineering
Nabi Bagh Bhopal 462038 (Madhya Pradesh)
Tel.: 0755-2747430 Fax 0755-2743016
E-mail: director@ciae.res.in

Auto-Grooving Machine

Salient features

- Auto-grooving machine makes helical grooves on the rollers used in gins. The roller is mounted horizontally between the chuck and the revolving centre. As the cutter saw moves forward from the head stock end to the tail stock end, the roller makes a rotation of 270° and a helical groove forms. A total of 18 grooves can be made on the roller.



Dimension, (l×w×h) : 2,000×600×700 mm
Power (blade) : 0.75 kW
Power (roller) : 0.75 kW
Weight of machine (kg) : 500

Performance

- Output capacity : 6 rollers/h
- Number of grooves : 18 per roller

Cost

- Unit cost : ₹ 1,50,000

Impact and benefits

- The auto-grooving machine reduces drudgery and improves the efficiency of grooving.
- Auto-grooving machine ensures timeliness as well as uniformity in grooving.

Manufacturers

- M/s Raji Electrical and Engineering
P/22 /7 Hingna MIDC, Nagpur 440028 (Maharashtra)
Tel: 07104-88284

Contact

Director

Central Institute for Research on Cotton Technology,
Adenwala Road, Matunga, Mumbai 400019 (Maharashtra)

Tel.: 022-24127273/ 76, 24184274, 24157238 Fax: 022-24130835, 24157239

Email: circot@vsnl.com

Compost Sieving Machine

Salient features

- A 2.2 kW motor driven unit to sieve the compost for preparation of nursery media.

Performance

- Capacity : 3-5 tonnes/h

Cost

- Unit cost : ₹ 7,50,000



Impact and benefits

- The finely sieved compost is very useful for nursery and used in pots.

Manufacturers

- Revolving Fund Scheme (RFS)
Division of Agricultural Engineering, IARI
New Delhi-110012

Contact

Head

Division of Agricultural Engineering

Pusa, Indian Agricultural Research Institute, New Delhi-110012

Tel.: 011-25842294 Fax: 011-25842294

E-mail: head_engg@iari.res.in

Motorised Media Siever

Salient features

- This machine is useful to sieve farm yard manure, vermi-compost, cocopeat, sand and soil and remove all the particles larger than 5/10/15 mm in the form of stones, clods, straw etc.

Performance

- Capacity : 1 tonne/h

Cost

- Unit cost : ₹ 1,00,000
- Cost of operation : ₹ 30/tonne



Impact and benefits

- It increases the efficiency of labour and seedling production.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
Tel.: 0816-2292159, 09886737260
- M/s Dolar Engg. Industries Pvt. Ltd.
#3, Adjacent to BIS Tumkur Road, 1st Stage, Peenya
Bengaluru 560058 (Karnataka)
Tel.: 080-28393000, 28395000 Fax: 080-28395006
- Directorate of Cashew Research, P. O.
Puttur Dakshini Kannada 574202 (Karnataka)
- National Research Centre for Citrus
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- Sher-e-Kashmir University of Agricultural Sciences and Technology Shalimar
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Tel.: 080-28466420 Fax: 080-28466291
Website: www.iihr.ernet.in

Media Mixer

Salient features

- The equipment is used for thorough mixing of sand, FYM, vermicompost, coco peat, etc. for nursery.

Performance

- Capacity : 0.5 tonne/h

Cost

- Unit cost : ₹ 1,00,000
- Cost of operation : ₹ 40/tonne



Impact and benefits

- It increases labour efficiency and seedling production.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
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Website: www.ihr.ernet.in

Rooting Media Sieve, Mixer and Bag filler

Salient features

- It is an integrated media sieve, media mixer and bag filler. It is useful to sieve farm yard manure, vermi compost, cocopeat, sand and soil and remove all the particles larger than 15 mm in the form of stones, clods, straw etc.



Performance

- Capacity bags/h : 700

Cost

- Unit cost : ₹ 4,00,000
- Cost of operation : ₹ 0.20/bag

Impact and benefits

- Increases the efficiency of labour and seedling production
- Social/environmental/other benefits
- Labour saving and time saving.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
Upparahalli Main Road, Tumkur 572 102 (Karnataka)
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Spawn Innoculators

Salient features

Bulk inoculator

- The spawn metering mechanism fills about 10 -15 g spawn to inoculate the grain filled bag.

Single bottle inoculator

- It has spawn bottle holder, in which spawn bottle with 300 g spawn is held by a person and spawn is poured inside the grain-filled bag.



Performance

- Capacity : 105 -150 bags/h

Cost

- Unit cost : ₹ 500

Impact and benefits

- The manual operation is time consuming and tedious. The machine increases labour efficiency and reduces time. It can inoculate 150 packets per hour (with bulk inoculator) and 105 (with single bottle inoculator) in comparison to 85 packets per hour with two persons in manual operation.

Manufacturers

- M/s Dharma Technologies
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Treated Rubber Wood Canoes and Rubber Wood Canoes Coated with FRP Cheaper Wood Canoes Coated with Fibre Reinforced Plastic (FRP)

Salient features

- It is maintenance-free fishing craft, free from decay and marine borer attack and improved resistance to impact and abrasion. Canoes constructed using Poma, Moje and Pine coated with FRP were found to be satisfactory.



Cost

- Unit cost : ₹ 20,000-30,000 per canoe

Impact and benefits

- Low cost, maintenance - free fishing canoe.
- Free from bio-deterioration after several years of operation.
- Reduces maintenance cost.

Manufacturers

- Director of Fisheries
Department of Fisheries
Government of Arunachal Pradesh Itanagar 791111 (Arunachal Pradesh)
Tel.: 0360-2212515 E-mail: meenarun-ita@gmail.com
- Director of Fisheries
Department of Fisheries
Government of Assam Meen Bhavan,
Gopinath Nagar Guwahati 781016 (Assam)
Tel.: 0361-2545104 E-mail: assam-fishery@rediffmail.com
- Kumbalam Inland Fishermen Development
Welfare Co-operative Society Ltd. (IFWCS)
No. FE 85/96 CZ, Kumbalam P.O., Cochin 682008 (Kerala)
- Vechoor Lime Shell Cooperative Society Vaikom Ltd.
No. 2407 Amibika market P.O. Vaikom, Kottayam (Kerala)
Tel.: 04822-275324

Contact

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Matsyapuri P. O. Cochin-682 029 (Kerala)
Tel.: 0484-0666845 0484-2668212
E-mail: cift@ciftmail.org

Boiled Grain and Chalk Powder Mixer

Salient features

- It mixes grain and chalk powder.

Performance

- Output capacity : 75 kg/batch

Cost

- Unit cost : ₹ 1,00,000



Impact and benefits

- It increases labour efficiency and reduces time and ensures hygienic operation.

Manufacturers

- M/s Dharma Technologies
1st Cross, 60 ft Road, Sapthagiri Extn (West)
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