Salient Achievements:

- ❖ Survey on method used for production of puffer rice is completed.
- ❖ The design of machine is done.
- ❖ Fabrication work of machine is completed.
- ❖ Construction of grader is under progress

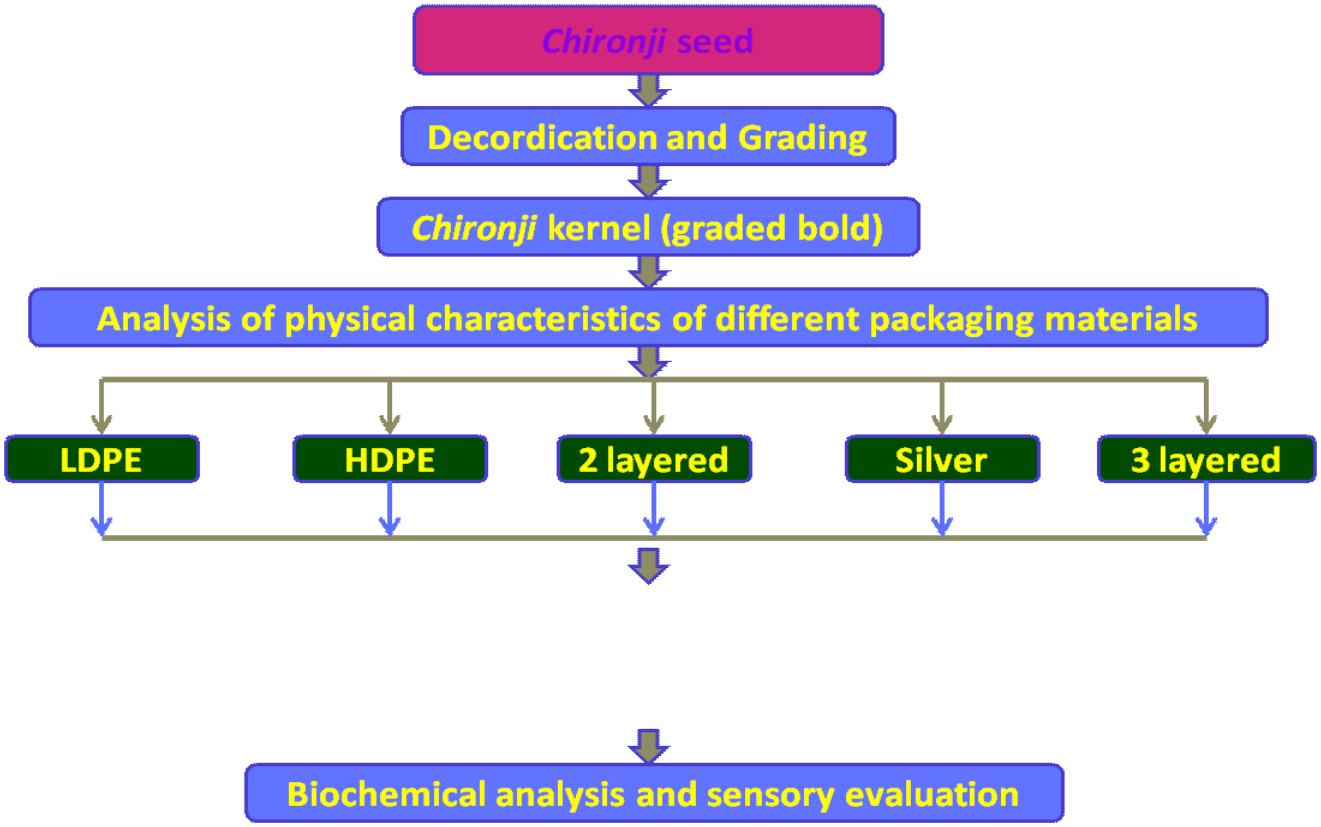
Investigation No. 5

Storage and biochemical analysis of chironji nuts collected from different geographical locations to decipher storage problem.

OBJECTIVES

1. Collection of chironji nut from different geographical locations (hot spot).
2. Biochemical profiling of chironji nut & kernel.
3. Storage study to enhance self-life of chironji kernel.

Storage Study of Chironji Kernel



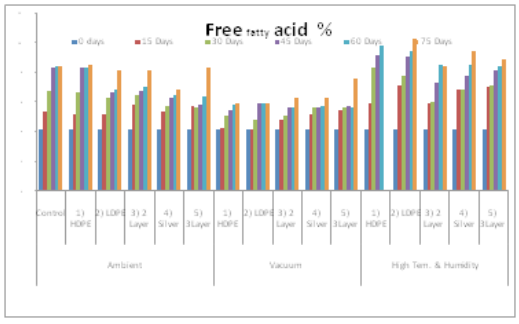
Samples with different packaging material and conditions

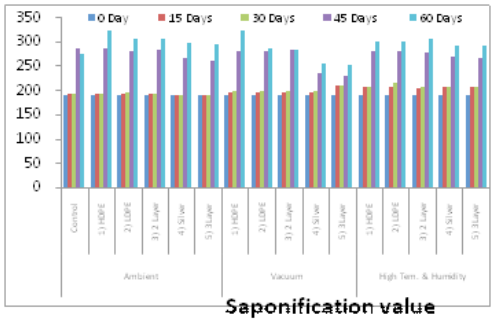
Packed at ambient condition

Packed in vacuum condition

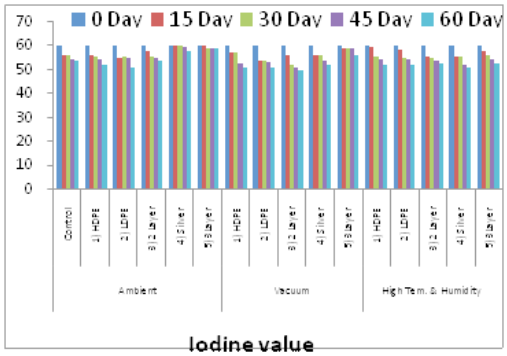
Packed with nitrogen gas flush

Qualitative Analysis of stored chironji kernel

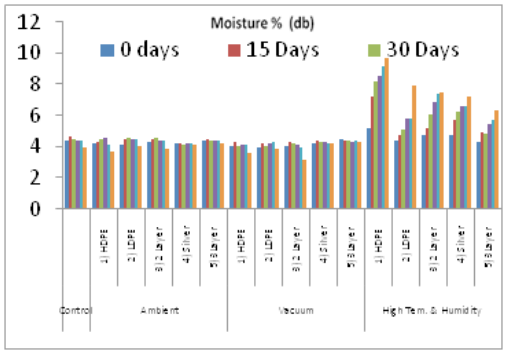




Saponification value



Iodine value



Chemical composition of extracted chironji oil

S. No	Compounds	% Area
1.	Tridecane	0.89
2.	1-Dodecanol	1.96
3.	1-Tetradecanol	14.58
4.	9-Hexadecanoic acid, methyl ester	2.16
5.	Hexadecanoic acid, methyl ester	21.61
6.	9-Octadecanoic acid, methyl ester	37.28
7.	Octadecanoic acid, methyl ester	5.96
8.	Methyl 9-cis,11-trans octadecadienoate	0.65
9.	2-Methoxy decanoic acid	1.47
10.	Cis-11-Eicosenoic acid, methyl ester	0.66
11.	Eicosanoate methyl	1.88
12.	Heptadecanedioic acid, 9-oxo-, dimethyl ester	0.25
13.	Phthalic acid, bis (2-ethylhexyl) ester (6CI, 8CI)	0.38
14.	Tetracosanoate methyl	0.66
15.	Docosanoate methyl	0.84
16.	Thiositosterol disulphide	0.24
17.	Hexadecanoic acid, tetradecyl ester	0.99
18.	Oleic acid, eicosyl ester	1.81
19.	Tetracosyl pentafluoropropionate	0.25

Salient Achievements

- ❖ Studies on physico-chemical properties at different level of moisture of chironji seed (nut), kernel and hull is done.
- ❖ Proximate analysis of the samples obtained from different localities is done.
- ❖ Storability study is under progress.
- ❖ The fatty acid profile of chironji oil is under progress.

Investigation No. 6

To create facility for cottage level processing of pulses in Mungeli district.

OBJECTIVES

1. Testing & evaluation of IIPR & PKV mini pulse mill.
2. Demonstration of IIPR & PKV mini pulse mill.

PROGRESS

IIPR Dal mill purchased. The testing/evaluation of the machine is in progress.



Performance of IIPR dal mill for milling of pigeon pea

Treatment	Dal Yield (%)	Husk (%)	Broken (%)	Powder (%)
Water soaking (50 min)	77.88	14.66	2.10	4.66

Performance of IIPR dal mill for milling of lathyrus

Treatment	Dal Yield (%)	Husk (%)	Broken (%)	Powder (%)
No Treatment	65.66	17.32	9.88	7.11
Water soaking (50 min)	68.33	17.1	8.66	5.88
Water soaking (6-7 h)	78.33	13.00	2.33	6.33

Investigation No. 7

Effect of Aloe vera gel based edible coatings on post harvest quality of custard apple during ambient storage

OBJECTIVES

1. To formulate and optimize aloe vera gel based composite edible coating for custard apple fruits.
2. To study effect of edible coatings on physico-chemical, properties of custard apple fruits stored at ambient conditions.
3. To study the effect of aloe vera gel based edible coating on shelf life of custard apple fruits stored at ambient conditions.

PROGRESS

Material used for Coating

T_1	T_2	T_3	T_4	T_5
Control	Aloe vera gel + Sago	Aloe vera gel +Gum arabic	Aloevera + Tulasi leaf paste	Aloevera + Mint leaf paste

Coating by dipping

Primary observation shows custard apple have herbal coating of Mint leave and Tulasi leaves paste has comparatively good eating quality on 7th day of storage.

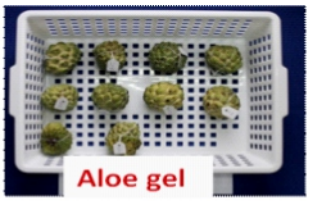
Primary observation shows custard apple have herbal coating of Mint leave and Tulasi leaves paste has comparatively good eating quality on 7th day of storage.

Need to repeat due to short time availability of fruits.

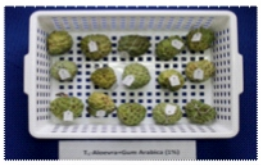
Inferences

- Use of gum enhancer is significantly superior as compared to mechanical and traditional methods of tapping in all the experimental trees.
- Amongst the gum enhancers use of ethephon in combination with H_2SO_4 was significantly superior for potential production of biopolymers.
- The rate of gum exudation as well as quantity was highest in H_2SO_4 + ethephon in all the experimental trees.

COATING OF CUSTARD APPLE



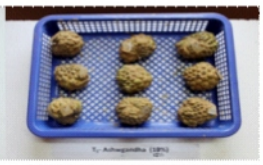
Aloe gel



Aloe + Gum Arb.

composite

Tulasi paste



Ashwgandha

Mint leaves

Storage

Analysis for PLW, TSS, PH, Acidity on 2nd, 4th, 6th and 8th day

Process flow diagram of idli premix

Raw materials
(Rice, Millet and Black gram)

Soaking for 24 h

Fermentation for 24 / 48 / 72 hrs

Drying

Grinding

Prepared the instant mixes by adding citric acid, sodium bicarbonate, yeast, salt

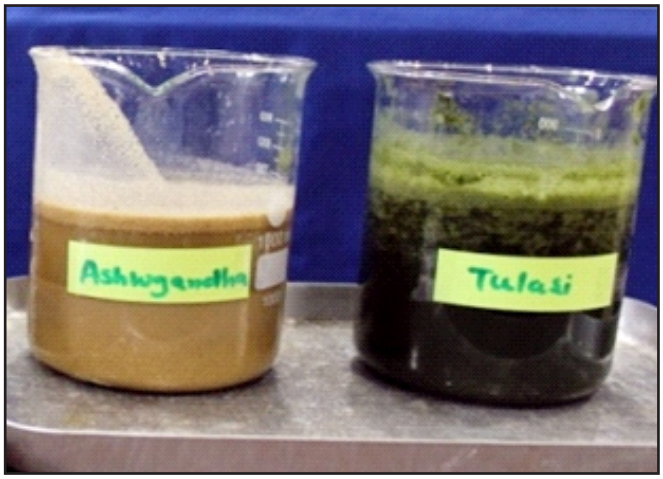
Packaging
(Aluminum foil, HDPE, PP, LDPE)

Quality analysis

PROGRESS

7 types of formulation/coating

- *Aloe vera gel*
- *Sago (10%)*
- *Gum arabic (2%)*
- *Sago + Gum arabic*
- *Ashwgandha powder paste (10%)*
- *Tulasi leaves paste(20%)*
- *Mint leaves paste (20%)*

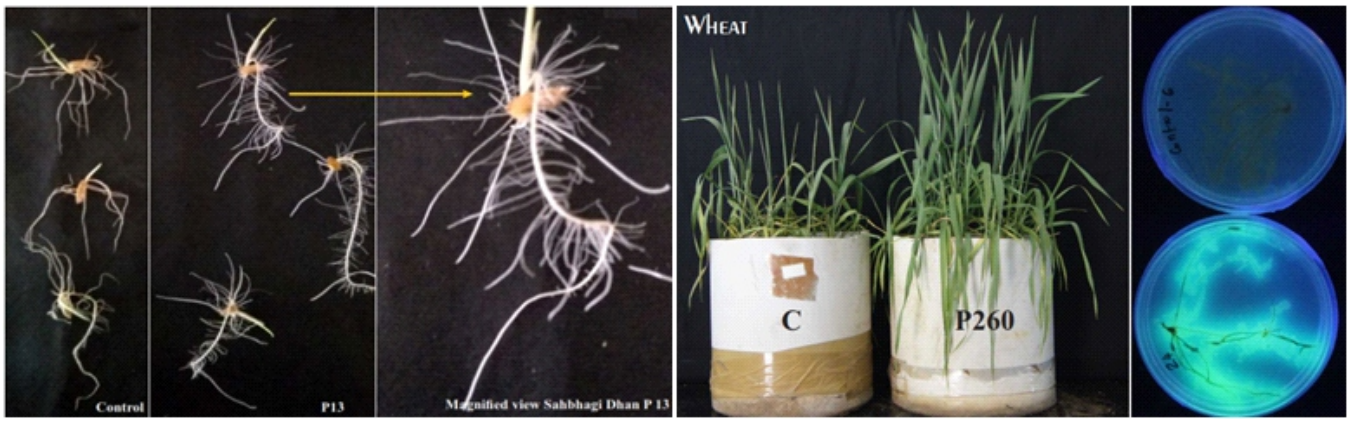


Crop Protection

Plant Pathology

Microbes for drought / water stress tolerance

- Identified potential isolates of fluorescent pseudomonas P23, P5, P8, P14, P141, P229 and P1, P2, P5, P7, P8, P10, P12, P13, P19 and P66 which induced tolerance to water stress till 12th day for Rice and wheat respectively. One of the isolate P260 imparts early emergence of panicle in wheat.



Large Scale Demostration Trials

Large scale demostration trials with Gamma radiation mutant of *Trichoderma on chickpea, lathyrus, pea and mustard were performed at Raipr KVK, Dhamtari, Bhatapara and Farm Bhatapara*

Control

Treated

Biodiversity collection of edible mushroom

1. Paddy straw mushroom *Volvariella volvaceae* mushroom from Raigarh Markets, Kharsia Markets, Saraipalli market, Janjgir Champa market
2. *Termitomyces* from Nagri Market; *Amanita* and *Termitomyces* from Jashpur market; Oyster Mushroom from Raipur; Medha, Kurra Dhamtari and Kanker; *Termitomyces microcarpus* from Raipur; *Termitomyces* from Raipur
3. *Calocybe indica* from Nagri, Dhamtari; *C. indica* from Charama, Kanker; *Pleurotus* from Jashpur ; *Volvariella diplasia* from Kharsia; *Scleroderma* Collection from Vaikunthpur, Korea

***Termitomyces microcarpus* from Raipur Nagri, Dhamtari**

Calocybe indica

***C. indica* from Charama, Kanker** ***Pleurotus* from Jashpur**

***Volvariella diplasia* Kharsia**

- Evaluation of *Volvariella volvacea* (29 strains) collected from Chhattisgarh at Kharsia **seven potential strains** were identified (Biological Efficiency (%) 9.82 to 33.39) Five were nominated for Advance Varietal Trial at national level

- In situ Composting of Agricultural waste demonstrated on large scale
- **Through KVKs :200; Through Biocontrol Lab 175; Total :- 375 (Crops – wheat, paddy, gram, sugarcane and maize)**

Mungeli

Mungali :Paddy straw decomposition followed by seed treatment

YIELD :-

Control:- 4 q / acre

Treated :-8 to 9.5 q /acre

- Development of liquid formulations from *Trichoderma* leachates Project Code- PATH-010 trials were conducted on soybean chickpea lathyrus and maize. Very strong effects were observed influencing growth and yield

- Development of vermicompost based Nutri-rich formulation by using different benificial Micro organism DAP 18:46 – 5%, 10% of carrier material (Vermi-compost) ; Beneficial Organisms 250 ml (CFU 1X 10^8). DAP in soluble form was added which resulted in easy availability of the nutrients to crop.

- SPS of linseed were done with :- MR to Alternaria Blight and Wilt; and R to PM & BUD BLIGHT
- RLP 13 was identified as late sown (15 dec sown) exhibiting Resistance to powdary mildew, wilt and bud fly and moderately resistant to *Alternaria* blight
- Management of Alternaria blight thrugh seed treatment with vitavax power and one spray with Saaf at the time of disease initiation.

Making the first report on Rust of chickpea

Alarming situation for late sown chickpea (20 to 30 % disease severity was observed

- Donor level resistance identified in the national & state germplasm for blb, sheath blight and blastand are maintained since kharif 2011-2017 & Rabi2014

Monitoring / Disease Survay

- During survay leaf blast and neck blast was observed (10-80%), rice var Rajeswari showed Losses:75-80% due to blast

Chemical Control

- Azoxystrobin 18.2%w/w+Defenoconazole 11.4%w/w Sc for sheath blight chemical control
- Effective for control of leaf blast and neck blast disease Trifloxystrobin 25% + tebuconazole 50% WG (Nativo 75WG) 0.4 g/L dose ; Tricyclazole 18 % + mancozeb 62 % WP (Merger) 2.5 g/L dose , WCPL 6060 @1250 ml/ha and Trifloxystrobin 3.5% + Propineb 61.3% WG.
- Wet and dry seed treatment of Evergol Xtend (Penflufen 154 + Trifloxystrobin 154 FS) as 10, 12, 14 ml/ g / kg effective against leaf blast and brown spot of rice

Millets

- Resistance to neck blast was identified in finger millet in different trials

- Kodo millet immune genotypes to head smut were identified
- The soil application of bio agent's combination of *P. f.* + *T. v.* + *B. s.* was found effective against the Bended leaf and sheath blight of little millet.

Button Mushroom Production at Jagdalpur




Two days training programme organized at Mushroom production Unit, SGCARS, Jagdalpur on 15 & 16 January, 2018


Participated Centers : BTCCARS, Bilaspur, KLSCHRS, Rajanandgaon, SKCARS, Kawardha, KVK's from, Kanker, Korea, Bhatapara, Janjgir, Jagdalpur

Entomology

Recommendations/Technology developed from Department of Entomology

- Spinetoram 6% w/v (5.66%) w/w)+ Methoxyfenozide 30% w/v (28.3% w/w) SC applied @ 375 ml/ha had minimum insect pest incidence with 20.99% increase in yield over control in rice crop.
- The sequential application of insecticides i.e. Chlorantraniliprole 18.5 SC> Flubendiamide 480 SC > Dimethoate 30 EC @ 30, 73 & 600 ga.i./ha was most effective against *Maruca vitrata* (2.40%) and *Helicoverpa armigera* (1.40%) in pigeon pea crop.
- Chlorpyriphos @10ml/l led to maximum recovery of 72.22 per cent trees without re-infestations followed by treatment Fipronil swabbing @ 2ml/l with 66.67 per cent cashew trees without re-infestations.
- Minimum pest damage and highest grain yield was obtained in tank mixed application of Spinetoram 6% plus Methoxyfenozide 30% (Insecticide) + Hexaconazole (Fungicide) @ 375ml +1000 ml/ha in Rice crop without affecting the efficacy.
- Whitefly, aphid and thrips population trapped maximum in yellow sticky trap with mustard oil in protected cultivation.
- Maximum Bracon adult trapping recorded in 60 Watt red bulb at Lab.

- Application of Bt (Bacillus thuringiensis) @ 1Kg/ha found best among all the treatments against Helicoverpa armigera Hubner in Chickpea during 2017-18 at Kawardha.
- Under DNA fingerprinting of rice germplasm out of 206 entries tested against BPH only two entries viz. Aatma Shital (A:328II) & Ajan (A:720) showed 0-1 score as highly resistant.
- Sakur, Sagar, and Sabour Yellow identified as promising linseed genotypes (<10% damage against budfly).
- Linseed +Gram (4:2) recommended as the best inter cropping system with the lowest budfly infestation and highest Linseed Equivalent Yield.

Newer finding (Bio-agent)

- **Eight different spp. of mealy bug** from 170 plant (Fruits, ornamentals, orchards etc.) were identified *viz.* maximum dominance **(50.88%)** was recorded of ***Phenococcus solenopsis,*** **followed by** ***Paracoccus marginatus*****, (14.04%),** ***Ferrisia virgata and Rastrococcus iceryoides*** **(12.28%) and** ***Nipacoccus viridi*** **(5.26%). The least dominating species were,** ***Saccharicoccus sacchari*****,** ***Coccidohystrix insolata*** **and** ***Maconellicoccus hirsutus*** of 1.75%.
- ***Cheilomenes sexmaculata, Brumoides suturalis, Scymnus spp., Chrysoperla sp.*** and **Spiders** were recorded as **predators**
- ***Aenasius bambawalei*** **and** ***Pseudleptomastix mexicana*** were the two **parasitoids** recorded from Chhattisgarh.
- **Nine spp. of coccinellids** recorded from different crop eco-system *viz.* ***Coccinella sexmaculata, Coccinella transversalis, Coccinella octomaculata, Angeleis cardoni, Scymnus latemaculatus, Brumoids suturalis, Propyleg dissecta*** and two unidentified.

Imported bio-agent (NBAIR, Bengaluru)

Cryptolaemus montrouzieri **is being mass reared in Bio-control laboratory**

1st Instar grub of *C. Montrouzieri* 2nd Instar grub of *C. Montrouzieri*

3rd Instar grub of *C. Montrouzieri*

4th Instar grub of *C. Montrouzieri*

Mealy bugs diversity

Adult of *Brumoides saturalis* attacking*P. solenopsis*

Larvae of *Scymnus* spp. attacking on *N. viridis*

Adults of *A. bambawalei* emerged from *P. solenopsis*

1. Coccinela sexmaculata

(Host plant :- Cowpea, pigeon pea, aonla, Indian bean, potato, mustard, cabbage, ashwagandha)

2. Coccinella transversalis (Cowpea, pigeonpea, Indian bean, aonla)

3. Coccinella octomaculata Cowpea, rice)

4. Angeleis cardoni (Host plant- Karanj)

***5. Scymnus latemaculatus (Host plant-* Cowpea, aonla)**

6. Brumoids suturalis (Parthenium)

7. Propylea dissecta (Host plant – Cowpea, ashwangandha, Withania sommifera)

8.Coccinellid unidentified (Host plant –Ashwangandha, Rice, Parthenium)

9.Coccinellid unidentified (Host plant –Ashwangandha, Rice, Parthenium)



Station :- Rajnandgaon **University funded**

Title	Result
Studies on different types and capacity of light source to attract *Bracon* in *corcyra* rearing laboratory	Maximum mean population of 194.67 adults were recorded in light trap having **60 Watt Red bulb** followed by 15 Watt CFL, 40 Watt Red and 5 Watt LED bulb with adult population of 148.02, 70.39 and 34.21 Braconid adults per trap. **The most attractive** light source to trap the adult **Braconids,** was found **60 Watt red incandescent light bulb.** It can be applied to trap the adult *Bracon* under *Corcyra* rearing laboratory.



Salient finding AICRP on Cashew

Jagdalpur

1. Significant positive correlation (r= 0.581) was observed between panicle TMB and relative humidity (evening).
2. Chlorpyriphos @10ml/l led to maximum recovery of 72.22 per cent trees without re-infestations followed by treatment Fipronil swabbing @ 2ml/l with 66.67 per cent trees without re-infestations.
3. Stem girth with less than 60 cm received minimum reinfestation.
4. With the increase in stem girth i.e. above 60 cm, reinfestation of CSRB was found to be higher.
5. Plants of age more than 15 years showed 50.55 percent reinfestation.
6. Minimum leaf folder infestation was recorded in NRC-191 (22.05%).
7. Germplasm, T-10/19 and Hy-367 received minimum nut thrips damage score with 0.17 score.

Lac (Korba)

1. Use of 60 mesh nylon net for brood lac inoculation, use of Brood lac @ 2-3 Kg, spray **Ethofenprox 10EC @ 2ml/L+Carbendazim 1gm/L** of water, at 30-35 and 60-65 days of inoculation gave 33.49% more yield with 56.09% *E. ambilis* and 45.83% *P. Pulveriya* larval reduction and **1:2.00 B.C. ratio** as compared to farmer practice.

2. Use of 60 mesh nylon net, use of Brood lac @5Kg (Kusum), 2-3 Kg (Ber), spray **Ethofenprox 10EC @ 2ml/l +Carbendazim 1gm/l** of water, at 30-35 and 60-65 days of inoculation gave **27.25% more yield** with 51.28% *E. ambilis* and 47.87% *P. Pulveriya* larval reduction and **1:2.10 B.C. ratio** as compared to farmer practice.

Cashew stem and root borer, *Plocaederus ferrugineus*

Affected Tree

Eggs

Adult

Grubs

Cocoon

Pupa


Management of Cashew Stem & Root Borer


Mechanical Removal

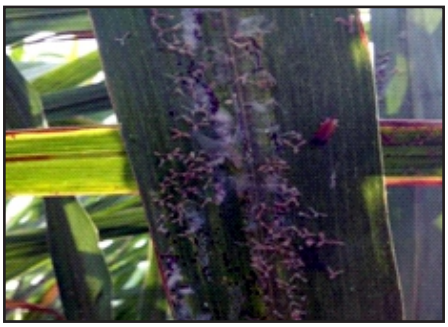





Salient finding

- Application of **NSKE @ 5%** found best among all the treatments against ***Helicoverpa armigera* Hubner** in Chickpea under both the experimental location during 2017-18 at **Kawardha.**
- Use of camphor oil was most effective among the botanicals in rice.
- Among 24 genotypes tested against ***pyrilla*, genotype Co 86032** showed minimum nymph and adult (13.76 nymphs and adults leaf^{-1}) population.
- The ***Pyrilla*** was **first occurred** in first fortnight of July and reached maximum with **8.13 eggs, 28.16 nymphs and 5.17 adults leaf^{-1} at first fortnight of October** and decreased further till first fortnight of January.
- Two natural enemies *viz.* egg parasitoid, *Tetrastichus pyrillae* (Chrawford) and ento-pathogenic fungus, *Metarhizium anisopliae* (Metschn) were found in sugarcane ecosystem and found effective against Pyrilla.
- Egg parasitoid, *Tetrastichus pyrillae* was first appeared in second fortnight of August and its parasitization increased till second fortnight of December (44.16 %).
- Ento-pathogenic fungus, *Metarhizium anisopliae* was first appeared in first fortnight of September and its parasitization increased till second fortnight of October (11.37 %).

Sugarcane leaf hopper, *Pyrilla perpusilla* (Walk.)



Testing trial of product concluded during 2017-18

Entomology

S. No.	Name of Product	Company	Recommendation
1.	**Goverdhan OSG 40 -35-25 SL in Paddy**	Om Sai Agri Clinic, Raipur	Application of **Chlorpyriphos. @ 1250 ml/ha** . was found highest efficacious against the target insect pests (Stem border, Leaf folder and BPH). It was statistically at par with the higher doses of test product i.e. **OSG 40 -35-25 (SL)** applied @ 7500 and 10000 ml/ha. The gain in yield of 25.29% w as achieved with (Chlorpyriphos insecticide) followed by test product (OSG 40-35-25 SL) (19.97%).
2.	**Flubendiamide 90 + Deltamethrin 60 W/V SC (Fame Quick 150 SC) in paddy**	Bayer Crop Science Ltd.	Insecticide **Flubendiamide 90 + Deltamethrin 60 w/v SC @ 300 ml/ha** was found highest efficacious against the target insect pests (Leaf folder and Hispa) and producing highest grain yield. It was statistically at par with product applied @ 250 ml/ha dose and reference product also. The gain in yield over untreated control was 20.88% with Flubendiamide 90 + Deltamethrin 60 w/v SC applied @ 300 ml/ha.
3.	**Flubendiamide 24% + Thiacloprid 24% - 48% SC (w/v)**	Bayer Crop Science Ltd	Ready Mixure of Insecticides Flubendiamide 24% + Thiaclopride 24%-48% SC@ 500 ml/ha was noticed as a best effective treatment against yellow stem borer and leaf folder of Rice.
4.	**BAS 450 011 300 SC against Lepidopteran pests of soybean**	BASF India Ltd.	All doses (12.6 to 25.2 g.a.i./ha) of BAS 450 II 300 SC and check insecticides i.e. emamectin benzoate and flubendiamide has been found effective against lepidopteron pests infesting soybean crop. The minimum population of Sp odoptera and semilooper were recorded in the test molecule BAS 450 II 300 SC with the dose of 18.6 g.a.i/ha which was at par with BAS 450 II 300 SC @ 12.6 g.a.i/ha and recorded satisfactory yield. BAS 450 II 300 SC with all the dosage also found relatively safe to natural enemies of insect pests of soybean.
5.	**Beauveria bassiana 1.15% WP (1x 108 cfu/g min.)**	Microplex Biotech & Agrochem Pvt. Ltd.	Check insecticide i.e. Quinolphos 25% EC @ 1.0 L/ha was the most significant out of different treatments in reducing the target insect population of the Chickpea crop. Out of different doses of the biopesticides of the company product tested at different doses, Beauveria bassiana 1.15% WP @ 3kg/ha as the second best treatment in keeping/reducing the target insect (Helicoverpa Armigera Hub.)

6.	**Verticillium lacanii under laboratory condition**	Microplex Biotech & Agrochem Pvt. Ltd	In vitro bio -efficacy of V. lacanni against H. armigera Hubner on Chickpea was evaluated. Profenophos 50% EC @ 1000 ml/ha) showed superior mortality (100.00%). Among the doses of V. lacanii, V. lacanii @ 4000 g/ha showed the maximum mortality of 62.50% followed by V. lacanii @2500g/ha (42.50%). Lowest percent mortality recorded in V. lacanii @ 1500g/ha (15.00%)which was superior than control. In vitro bio -efficacy of V. lacanii against H. armigera Hubner on Chickpea on 8th day, treatment Profenophos 50 % EC @ 1000ml/ha) and Neem oil Azadirachtin 0.03%@5000ml/ha proved as the best with mortality of 100.00%. Among the doses, V. lacanii @2500g/ha (40.00%) was on par with V. lacanii @ 2000g/ha (32.50%).
7.	**Verticillium lacanii against gram pod borer, Helicoverpa armigera Hubner under laboratory condition**	Microplex Biotech & Agrochem Pvt. Ltd.	M. anisopliae against H. armigera Hubner on Chickpea on 8th day among the treatments, Profenophos 50% EC @ 1000 ml/ha showed superior mortality (100.00%) followed by Neem oil Azadirachtin 0.30% @ 5000ml/ha (92.50%) of Among the doses of M. anisopilae T4 (M. anisopilae @ 4000g/ha) showed the maximum mortality of 67.50% followed by T3 (M. anisopilae @ 2500g/ha) 52.50% and T2 (M. anisoplia e@2000g/ha) 37.50%. Minimum percent mortality were recorded in T1 (M. anisopliae @ 1500g/ha) 17.50% which was superior than control. In vitro bio-efficacy of M. anisopliae against H. armigera Hubner on Chickpea year 2016-17 presented table 4 revealed that on 8th day among the treatments, both Profenophos 50% EC @ 1000ml/ha and Neem oil Azadirachtin 0.03% @5000ml/ha showed 100.00% mortality. Among the doses of M. anisopliae M. anisopliae @5000g/ha showed the maximum mortality of 70.00% followed by M. anisopliae lacanii @ 2000g/ha) 32.50%. Lowest percent mortality was recoded in T1 (V. lacanii @ 1500g/ha) 17.50% but was superior than control.
8.	**Metarhizium anisopliae against H. armigera on chickpea.**	Microplex Biotech & Agrochem Pvt. Ltd.	Among three doses, Metarhizium anisopliae, when applied at 3000 g/ha, was most effective with 10.15% pod damage and 1700 kg/ha yield. Although it was significantly less effective than standard check Azadiractin 0.30% and Quinalphos 25 EC @ lit/ha.

9.	**Verticillium lecanii 1.15% WP (1x108 cfu/g min.)**	Microplex Biotech & Agrochem Pvt. Ltd.	The minimum pod border infestation was observed in T4 which was at par with quinalphos. Among the bio - pesticides treatment T2 (2000g.ha) and T3 (2500g/ha) were at par and superior to untreated control and lower dose of Verticliium lacanni (T1). The similar trends were also observed on chickpea grain yield which was lowest in untreated control (17.93 q/ha) followed by T1 T2 T3 T4 and T5 Verticillium lacanni @ 1500, 2500 g/ha was no phyto -toxic to the chickpea crop but when applied @ 40 00 g/ha the edge of the leaves turned partially dry which recorded in 10 days after spray.
10.	**Imidacloprid 17.1% w/w SL (Imidacloprid 200 SL) against plant hopper in Rice.**	Bayer Crop Science	Buprofezin 25% SC @ 800 ml/ha was found effective against the brown plant hopper and white backed plant hopper. Thiamethoxam 25% WG @100 g/ha was recorded as effective against the green leaf hopper. Test molecule Imidacloprid 17.1% w/w @ 600 ml/ha, Imidacloprid 17.1% w/w @ 300 ml/ha, was found as moderate effective insecticide doses against the paddy plant hoppers.
11.	**BAS 835 UB H against weeds in soybean**	BASF India Limited	Considering the weed density, weed dry matter, weed control efficiency at different stages, yield attributes and yield of soybean, the testing product BAS 835 UBH (imazethapyr 23 g 1-1 + imazamox 23 g 1-1 + bentazaone 460 g 1-1) in all the application dose s not performed superior over other testing herbicides like Imazethapyr @ 100 g a.i. ha -1 and Imazamox @ 42 g a.i. ha -1 but performed superior over reference product Chlorimuron ethyl 25% WP.
12.	**Laxmi bardan**	Horticon sales Pvt Ltd	Application of 75% RDF or 100% RDF (120:60:40 kg ha -1) + Laxmi bardan @100 kg/ha as basal + Margonol @ 1000 g/ha at 15 and 35 DAT + Grow boost HNF @ 2000 ml/ha at 21 and 42 DAT were similar and superior with respect to growth characters, yield attributes, yield, gross return , net return and B:C ratio of rice as compared to other treatment combinations.

13.	**XR-848 Benzyl Ester 20g/L + Cyhalofop Butyl 100g/L EC (w/v)**	Dow Agro Science	Use of new PoE XR -848 Benzyl Ester 20g/L + Cyhalofop Butyl 100g/L EC (w/v) 150 or 180 g a.i ./ha shall be quite appropriate for control of sedges, grasses and broad leaf weeds and resulting in higher rice grain yield and superior than standard herbicide Cyhalofop Butyl 100 g/L EC (w/v) 150 and Bispyribac sodium 10% SC 25g a.i/ha. It was effective against Echinochloa colona, Ischaemum rugosum, Alternanthera triandra, spilenthes acmella and Cynotis axillaris, Cyperus iria, Fimbristylis milliace and othe weeds.
14.	**AeROS on Rice**	Excel Crop Care Limited	The growth param eters and yield of transplanted rice were significantly higher under twice foliar application of AeROS @ 625 ml/ha, first at 25 -30 DAT and second at 55 -60 DAT, but it was comparable with its lower dose of 450 ml/ ha over control.
15.	**Cyclanilide 22 +Mepiquat Chloride 88 SC in Soybean**	Bayer crop sciences	Application of Cyclanilide 22+Mepiquat Chloride 88 SC @ 400 ml/ha followed by application of Cyclanilide 22 + Mepiquat Chloride 88 SC @ 200 ml/ha is beneficial for fetching higher yield of soybean.
16.	**BAS 750 F 133 g/L pyraclostrobin 178 g/L + Fluxapyroxad 89 g/L (BAS 753 02 F)**	BASF India Ltd.	Treatment BAS 753 02 F (T1) was significantly superior in reducing the disease severity of MLS followed by BAS 753 02 F (T2) and BAS 753 02 F (T3) while BAS 753 02 F (T2) was superior in reducing the severity of TLS followed by BAS 75 3 02 F (T1) and BAS 753 02 F (T3). Maximum yield was recorded in BAS 753 02 F (T4) with 4.2752 kg/plot.
17.	**PIF 320 5% SC against sheath blight of rice**	PI industries Ltd	PIF 320 5 % SC @ 30 g a.i./ha (600 ml/ha) is the most effective in management of rice sheath blight disease and produce maximum yield which is followed by the validamycin 3% L @ 2000 ml/ha.
18.	**RIL-084/F1 (0.5% Gr) in Rice**	Rallis India Ltd	Fungicide RIL -084/F1 (0.5% Gr) @ 200g a.i./ha found superior in effective reduction of rice sheath blight disease with maximum grain yield.

Extension Activities

Performance Evaluation of *Deshi* Poultry Birds

Aseel: Korea

Kadaknath

Kuroiler: Gariaband

Vanraja: Rajnandgaon

Commercial Dual Purpose Poultry : Kuroiler

For Self Sustainable Market Led Backyard Poultry Farming under KVK Gariaband

Highlights

1. Training under MMKVY Completed for 85 Women SHG members.
2. DMF funded project in 4 villages started in Feb 2018.
3. Market linked for input supply of day old chicks & feed.
4. Market linked for vaccination and sale of birds established.
5. Support under MGNREGA for 2 Active Women (NRLM) from each village by construction of Poultry House. They are focal point of sale / purchase by other women SHG members.
6. 2 OFT and 2 FLDs emanating from the project funds.

0-6 Day Stage

30 Day Stage

Community Lift-cum-Micro Irrigation Model : Surgi, Rajnandgaon

SN	Particulars	
1	Distance from kharkhara river to storage tank (fixed PVC pipe 200 mm dia)	**2.1 km**
2	Electric pump used for lifting of water (5 hp)	**2 Nos.**
3	Total farmer benefitted	**50**
4	Area irrigated	**75 acre**
5	Electric pump used for irrigation (3 hp)	**7 Nos.**
6	Drip fitted	**75 acres**
7	Non return valve, air release valve used	**3+7 Nos.**
8	Project cost (Rs. In lakh)	**78.9**
9	Farmer share + Convergence	**31%**
10	**Annual operation cost (Rs. In lakh)**	**3.19**
11	**Subsidies on electric pumps annually (Rs.)**	**2.74**
12	**Annual irrigation charges(@Rs.3000 /year/acre) (Rs. In lakh)**	**2.25**
13	No. Of crops grown (rice + rabi+ summer vegetables)	**3 crops**
14	Fish rearing in pond, fingerlings	**12,000**
15	Duck rearing	**50 Nos.**
16	Plantation on pond bund- mango, apple ber etc.	

Production of Vermicompost & its Horizontal Spread

Production of Vermicompost and its Horizontal spread

SN	Name of KVK's	No. of village	No. of farmers	No. of Units (12x3x2 ft)	Total Production (t/yr)	Value (Rs. In lakhs)
1	Korea	6	321	321	963	48.15
2	Bastar	22	176	176	528	26.4
3	Narayanpur	56	174	174	522	26.1
4	Rajnandgaon	42	120	124	372	18.6
5	Gariyaband	75	176	176	528	26.4
6	Bhatapara	18	56	56	168	8.4
7	Dantewada	33	42	58	174	8.7
8	Dhamtari	23	35	38	114	5.7
9	Janjgir-champa	72	104	176	528	26.4
10	Bilaspur	8	10	25	75	3.75
11	Mahasamund	4	52	220	660	33
12	Kanker	50	250	250	750	37.5
	Total	**409**	**1516**	**1794**	**5382**	**269.1**




Development & Testing of Prototype of Mushroom Growing Kit : KVK Gariaband

Methodology: Tear along the dotted line of the carton on both sides. Make an "X" shaped cut on the exposed polythene sheet and open it gently without tearing the sheet. Spray a little water (15-30 ml) every morning & evening on the exposed part for 12-15 days. Once the pin heads begin to sprout, continue spraying a little water for few more days till sufficient growth is obtained. Harvest mushrooms with a sharp knife from the base of the mushroom stalks. After 3 harvests of mushrooms, dispose the contents in bio dustbins or make manure mixed with cow dung in equal proportions.

All time fresh mushroom in kitchen




Production of Cattle and Poultry Feed: KVK Gariaband

Characteristics

1. Using under size grain of rice kanki, gram and others
2. Preparing at kvk farm
3. Nutritionally better than feed available in market
4. Selling price on feed available in market I Rs. 24/ kg but our selling price will be around Rs. 20/kg

Composition for 1 Kg

1. Rice Kanki 500 g
2. Chick Pea 250g
3. Rice Bran 120 g
4. MSC 50g
5. Bio Meal 50 g
6. Mineral Mixture 20 g
7. Calcium Granules 10 g

Quality Tested by Nutrition Department, Veterinary College Anjora

Formation of Seed Company: *Jai Kopeshwarnath Krishak Utpadan Sangathan Company Limited at* Bhendri, Block Fingeshwar by KVK Gariaband

1. 50 Farmers trained under MMKVY Skill Development at Village
2. Collected Rs. 1000 each farmer as share
3. Paddy Seed Production at individual farm.
4. Registration of Company with CG Seed Certification Agency.
5. MOU with KVK for utilization of Grader Machine and Godown (2018-19) on cost basis
6. Self Marketing in Open Market and through Krishi Kendras
7. Buy back of ungraded paddy by KVK for Poultry/Cattle Feed

Establishment of Nutritional Gardens

Horizontal spread of technology in Chhattisgarh

Name of KVK	No. of Village covered	No of Farm women	No. of Schools	No of Unit
Bilaspur	40	86	03	89
Kanker	80	270	80	350
Gariyaband	25	-	25	25
Raigarh	05	50	-	50
Raipur	03		3	03
Ambikapur	15	100	1	101
Total	168			

Nutritional Garden at Tribal Boys Hostel, Gariyaband

Nutritional Garden at KVK Bilaspur

Nutritional Garden at schools by KVK Raipur

Nutritional Garden at schools by KVK Kanker

News Papers Coverage

Herbal *Gulal* Production : KVK Dantewada

Tesu flower

Lal bhaji

Palak

Sindoor fruit

Haldi

Preparation of Herbal Gulal

Description of Technology adopted:

- In India on the occasion of different festival as well as happiest movement Gulal of different colour has been used.
- But in present situation Gulal available in different colour in market is highly harmful to human body due to content of chemicals.
- Heavy metals are known to be systemic toxic which disrupt the body's metabolic functions and also build up in the body's vital organs such as the kidneys, liver and bones. Asbestos and silica are also extremely dangerous.
- Krishi Vigyan Kendra Dantewada (South Bastar) has started to process and produce Gulal of different colour which is purely organic and have no any side effect on human body
- Tikhur (*Curcuma angustifolia*) are used as a base material in production of herbal gulal, which is abundantly found in the forest of Dantewada district.
- The Scientists of KVK provide technology for the preparation of Organic Gulal of different colour as well as formed WSHGs for this purpose.
- One WSHG having nine members has been started the production of Organic Gulal

Chemical compound found in Inorganic colour and their effect on human health

Colour	Chemical compound	Effect on Human Health
Green	Copper sulphate	Allergies in eye or even temporary blindness
Purple	Chromium iodide	Bronchial asthma or other forms of allergy
Silver	Aluminum bromide	Carcinogenic
Black	Lead oxide	Renal failures or learning disability
Red	Mercury sulphite	Skin cancer or minamata disease

Herbal *Gulal* Products

Particulars	Cost Rs./1kg Gulal)
Media cost	45
Colour cost	20
Per kg. Labour cost	20
Packaging	8
Marketing &Transportation	5
Total	100
Selling Price	350

Preparation of Organic Gulal of different colours

Colour	Common Name of Natural stain/Product	Botanical name	Description/use	Effect on Human Health
Red (bixin)	Sindoor tree (local name in Bastar)	Bixa Orellana L.	Pulp of the seed is also used to colour, oil, butter and to dye clothes. Also mixed with jaivik sindoor made by KVK dantewada	No effect
Yellow (orellin)	Annatto, Lipstick Tree / Tesu	Bixa Orellana L.	Used as Turmeric	No effect
Pink	Lal Bhaji/ Beat	Amaranths sp	Used as leafy Vegetable	No effect
Light yellow	Palash Flower	Butea monosperma	Used Medicinal Plant	No effect
Green	Spinach/ Beans	Amaranths sp	Used as leafly part	No effect
	Beat	-	Used as a bret fruit	No effect

Herbal Gulal Product by KVK Dantewada (C.G)

Impact of adopted technology in economic and social terms:

- Promotion of scientific herbal gulal production gives us assured ecological approach for economic development
- Commercialization of herbal gulal will provide empowerment to woman and also they are linked with marketing opportunities which makes women a good source of income at household level.
- It has good market price and high demand in the market due to its herbal nature and it provide opportunities to use locally available forest produce (Tikhur) and provided higher return with the B:C ratio of 3.68 as well.


फूल, पत्तियों और सब्जियों से तैयार हो रहा हर्बल गुलाल

कृषि विज्ञान केंद्र दंतेवाड़ा कर रहा उत्पादन, बाजार में 350 रुपए तक बिक रहा गुलाल

HAPPY HERBAL
holi to all of you

Electronic & Print Media Coverage of Herbal Gulal

Performance Evaluation of Aquatic Crops

- Makhana
- Lotus
- Water Chestnut

Makhana Cultivation at KVK Dhamtari

	Particulars	Cost (Rs.)		Popping factors	
Input Cost (Rs/ha)	Rent of land for one year	15,000	Manual popping	Recovering (%)	35
	Seed (80 kg)	8,000		Makhana pop produced (kg/ha)	910
	Weeding (11 labours)	2,160		Gross return from makhana pop (270 Rs./kg)	245,700
	Fertilizer @NPK 100:60:40, FYM 15t/ha	8,615		Cost of popping @Rs.3000 /qt	27,300
	Insecticide and fungicide	1,000		Miscellaneous cost	10,000
	Harvesting of crop (132 labour/ha)	40,000		Net profit by Manual popping	208,400
	Transportation charges	1,000	Mechanized popping	Recovering (%)	40
	Miscellaneous	2,000		Makhana pop produced (kg/ha)	1,040
	Total cost of Input	77,835		Gross return from pop (270 Rs./kg)	280,800
Output	Average seed yield q/ha)	26		Cost of popping @Rs.3000 /qt	30,160
	Gross return (Rs/ha)	182,700		Miscellaneous cost	10,000
	Net return (Rs./ha)	104,865		Net profit by Manual popping	240,640

Representation of Year Round Cultivation of Makhana at Bihar in Pond System

<table>
<tr><th></th><th>Dec</th><th>Jan</th><th>Feb</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sept</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>1</td><td rowspan="15">Healthy Makhana Seeds are spread on the upper surface of water bodies</td><td rowspan="23">After 35-40 days the seeds germination starts at the bottom of the ponds</td><td rowspan="15"></td><td rowspan="15">The Makhana leaves float on the upper surface of the water</td><td rowspan="23">Young plants of Makhana are transplanted at spacing of 1x1 mts.</td><td rowspan="6"></td><td rowspan="6">Flowering of plants takes place where the bright purple and solitary flower starts to appear.</td><td rowspan="15">Fruit developing stage where after flowering the fruit get fully matured and starts to burst. The seeds float on the surface of water and after 2-3 days they start to settle down in the bottom of the plant.</td><td rowspan="9"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">Regermination of Makhana seeds continues.</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td><td rowspan="21">Processing takes place</td><td rowspan="21"></td></tr>
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<tr><td>6</td><td rowspan="17"></td></tr>
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<tr><td>8</td></tr>
<tr><td>9</td><td rowspan="16">Seeds are collected with the help of Gaaja from the bottom of water body.</td></tr>
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Representation of Year Round Cultivation of Makhana at Chhattisgarh in Pond System.

	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
01--15			Transplanting of seedling of makhana at 2 leaf stage at 1x1 mts	Flower-ing of plants takes place where the bright purple and solitary flower starts to appear	Fruit develop-ment, Bursting and seed settlement	Fruit develop-ment, Bursting and seed settlement	Seeds are collect-ed with the help of Gaaja from the botto m of water body.		Transplanting of seedling of makhana at 2 leaf stage at 1x1 mts	Flowering of plants takes place where the bright purple and solitary flower starts to appea.	Fruit develop-ment, Bursting and seed settle-ment	Fruit develop-ment, Bursting and seed settle-ment	Seeds are collect-ed with the help of Gaaja from the botto m of water body.
16--31	Heathly Makhana Seeds are spread/Broadcasted on the upper surface of water bodies	Germination Started after 30-35days of broadcasting seeds on water filled pond		Fruit developing stage where after flower-ing the fruit get fully matured and starts to burst. The seeds float on the surface of water and after 2-3 days they start to settle down in the bottom of the plant.	Fruit development, Bursting and seed settle-ment	Leaf Cutting and Decomposition for Harvesting	Nursery Raising for next season crop	Germination Started after 30-35 days of broadcasting seeds on water filled pond		Fruit developing stage where after flowering the fruit get fully matured and starts to burst. The seeds float on the surface of water and after 2-3 days they start to settle down in the bottom of the plant.	Fruit development, Bursting and seed settle-ment	Leaf Cutting and Decomposition for Harvest-ing	Nur-sery Rais-ing for next season crop

Lotus cultivation at KVK Dhamtari

Economics of Lotus Cultivation

Name of item	Rate per unit	Total cost
Input Cost (Rs/ha)		
Rent of land for 1 year	15,000	15,000.00
Field Preparation	2000.00	2000.00
Rhizome(100 kg)	5.00	5000.00
Transplanting	2000.0/acre	5000.00
Weeding (40 labours)	204.00	8160.00
FYM 15t/ha	-	8000.00
Insecticide and fungicide		2000.00
Digging of crop	300.00per day (140 man day)	42,000.00
Transportation charges	1000.0	3000.00
Miscellaneous	2000.0	2000.00
Total cost of Input		**92,160.00**
Output		
Average Rhizome yield 50 q/ha	@Rs.35.00 per kg	1,75,000.00
Lotus flower 1000 sticks/ha	@Rs.1.5 per stick	1500.00
Lotus pod 500	@Rs.1.5 per pod	750.00
Lotus seed (5 Kg/ha)	@400.00 per Kg	2000.00
Net Monetary return (Rs./ha)		**82,840.00**

View of Lotus Cultivation under Field Condition

Field preparation for Lotus cultivation

Rhizomes treated with Carbendazime @0.2%

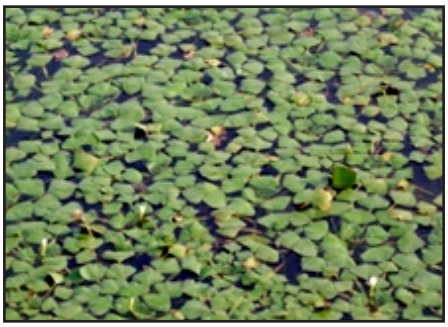
Transplanting of Lotus Rhizomes

Lotus cultivation under Field condition

Water chestnut cultivation at KVK Dhamtari

Economics of Waterchestnut Cultivation at Farm Pond

Name of item	Rate per unit	Total cost
Input Cost (Rs/ha)		
Rent of land for one year	15,000	15,000.00
Field Preparation	2000.00	2000.00
10,000 plants	1.50	15000.00
Transplanting	2000.0/acre	5000.00
Weeding (40 labours)	204.00	8160.00
Fertilizer application @NPK 100:60:40, FYM 15t/ha	-	8615.00
Insecticide and fungicide	-	2000.00
4 Picking of nuts (20t/ha) (47 man days)	204.0	9500.00
Transportation charges	1000.0	3000.00
Miscellaneous	2000.0	2000.00
Total cost of Input		**70,275.00**
Output		
Average nut yield 20t/ha	@10.00 per kg	2,00,000
Net Monetary return (Rs./ha)		**1,29,725.00**



Banana Fabrics

By SHG Farmers groups under KVK Janjgir-Champa

Procedure:

- Collection of Banana stem after fruit harvesting which are generally treated as a waste material.
- Separation of first layer from banana stems with the help of knife/ sickle.
- Separation of stem pulp and moisture from the layer with the help of sugarcane juicer machine.
- Threading process.
- Collection of two type of thread (thin & thick) separately by **Ashari.**
- Separated thick types of thread are used for Jacket, Blazers & thin types of thread are used for Sari, Towels & Shirts by the help of manual machine.

Impact:

- This innovative works is first in Chhattisgarh state.
- After fruit harvesting of Banana stem which was treated as a waste material can be best utilized for cloth making.
- More price than normal cloth due to more demands
- District administration is going to register through Jajwalya Dev Krishak ATMA Samiti Baloda for future development.

Time & Cost:

- Generally 11 days required for preparation of one meter cloth by using 42 number of Banana stem.
- Rs 1500/ cost estimated by SHG groups for one meter cloth.

Role of KVK:

1. KVK technically supported and provided related information for their innovative work.
2. KVK Supported SHG farmers group by linking with Banana Research Centre for more information.
3. SHG group were invited for exhibition during training cum awareness programme of PPV & FRA at KVK Janjgir-Champa.
4. Innovative SHG groups were participated at state level IGKV Raipur for their innovative work related exhibits.

- 5. KVK promoting the product through startup online marketing & registration process through PPV & FRA.
- 6. KVK & concern SHG group are connecting more SHG groups in the district.

Process of making cloth from banana stem

Collection of Banana stem

Separation of first layer from banana stems

Separation of stem pulp and moisture

Threading process

Cloth making process through manual machine

District Collector

Visit by Young Canadian Fellow

केला रेशे से तैयार कपड़े से प्रधानमंत्री का स्वागत

केले के रेशे से तैयार कपड़े से भारतीय कृषि अनुसंधान संस्थान नई दिल्ली में आयोजित राष्ट्रीय जैविक कृषि मेला के उद्घाटन समारोह के दौरान प्रधानमंत्री नरेन्द्र मोदी का स्वागत किया गया। पीएम मोदी ने कपड़ा बनाने वाली टीम को बधाई दी।

कृषि विज्ञान केन्द्र के वरिष्ठ वैज्ञानिक सोमाडास मार्टा ने बताया कि 17 मार्च को भारतीय कृषि अनुसंधान संस्थान नई दिल्ली में राष्ट्रीय कृषि मेला का उद्घाटन प्रधानमंत्री नरेन्द्र मोदी ने किया। इस जीव जानकदेव कृषि उन्नत समिति जालीडा की केला अनुसंधान टीम के खोरा डीह व कोसमंडा के 15 स्वसहायीय टीम द्वारा तैयार केला कपड़ा से पीएम मोदी का स्वागत किया गया। वहीं जैविक कृषि मेला के स्टाल पर केले के रेशे से तैयार कपड़ा आकर्षण का केंद्र रहा। केला अनुसंधान टीम के प्रमुख दीनदयाल यादव, रेकनी यादव व जितेन्द्र कुमार यादव ने बताया कि केले के तने से रेशे निकालने का काम फिलहाल अभी तक हाथों से किया जा रहा है। मगर अब इसे आसान तरीका बनाने के लिए रेसपेडर नामक मशीन का सहारा लिया जाएगा। कपड़े की मांग को देखते हुए अब बड़े स्तर पर इसकी कार्ययोजना बनाई जा रही है। अनुसंधान टीम के कोषाध्यक्ष श्रीमती गीता यादव, राजेश कुमार यादव व शोभाराम यादव ने बताया कि केला का रेशा हाथ से निकालने में तथा निलेन मशीन से कपड़ा बनाने में खूब मेहनत करना पड़ा। मगर अब यह काम उनके लिए आसान हो गया है। उन्होंने बताया कि महीने भर के भीतर अब उनकी टीम केला कपड़ा से साड़ी जैकेट भी पर्याप्त मात्रा में तैयार कर लेंगे। टीम के कार्यक्रम अधिकारी प्रसाद कौशिक ने बताया कि अन्नदाता किसान बहुद्देशीय सहकारी समिति मर्यादित खोरा डीह में शामिल 50 किसान, महिला समूह के लोग इस काम को शुरू करेंगे।

TV Interview

Online Marketing of Organic Products : Amazon marketing

Krishi Vigyan Kendra Janjgir-Champa initiated the start-up programme incorporated with the innovative farmer Mr. Rakesh Kumar Jaiswal through Brand Name **Navya Agriallied regarding on line marketing** of vermicompost, cow dung compost, Cow Dung Cake, Neem Cake, Goat Manure, Potting Soil and other organic and daily used products.

Impact:

Higher Price

Global Marketing

Quick delivery system with feedback

Lower operation cost

Online marketing is important because it aligns with the way consumers make purchasing decisions.

It allows to target specific people or specific consumers that are likely to buy your product.

Role of KVK:

KVK Janjgir-Champa motivated farmers to link up through Online Marketing.

Registration procedure of various products in online marketing platforms.

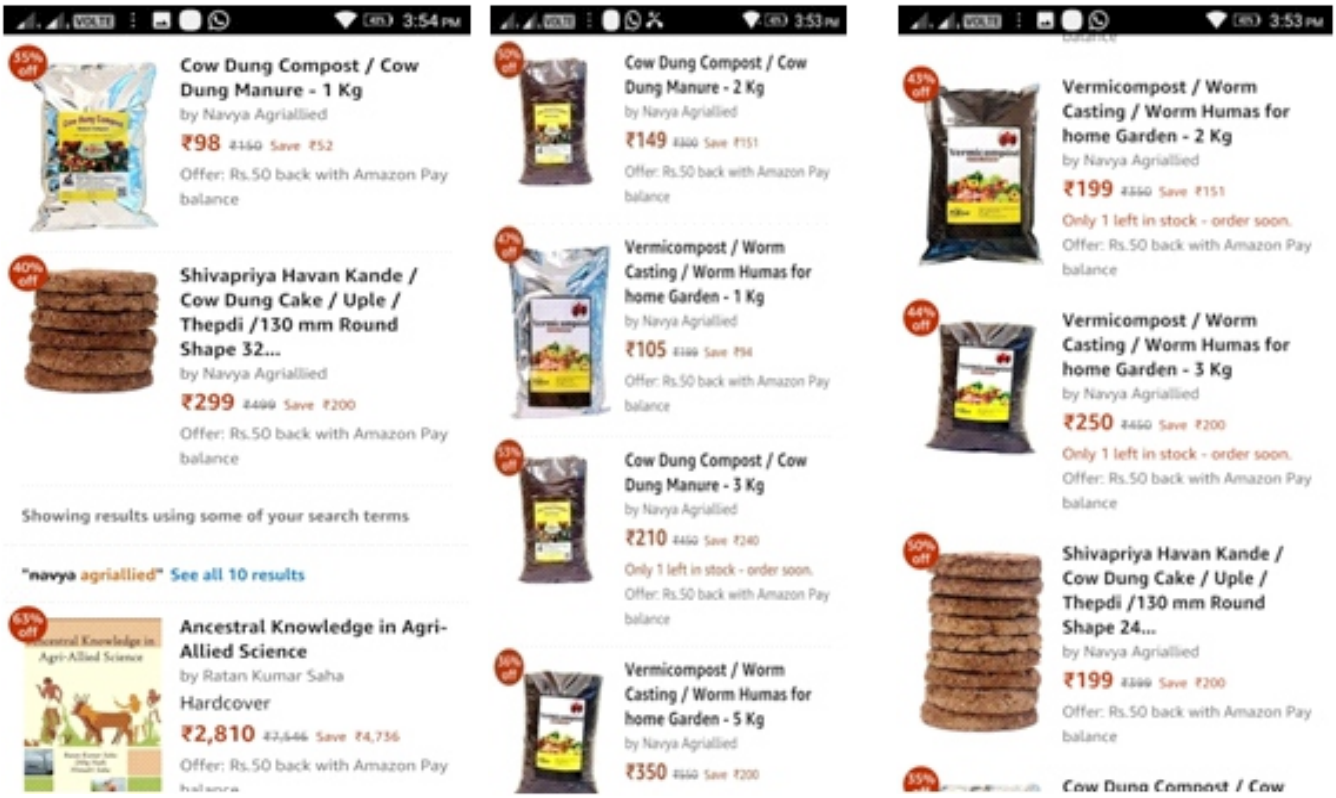
Designing and packaging of the products for selling.

Technical guidance regarding component of the products, viability, nutritional importance, doses, processing and refinement, utility of the product.

Advertisement of product

Connecting the various farmers and SHGs for collection of various product

KVK Concerned NGO Navya Agriallied Started On-line Marketing of Organic Based 52 Products

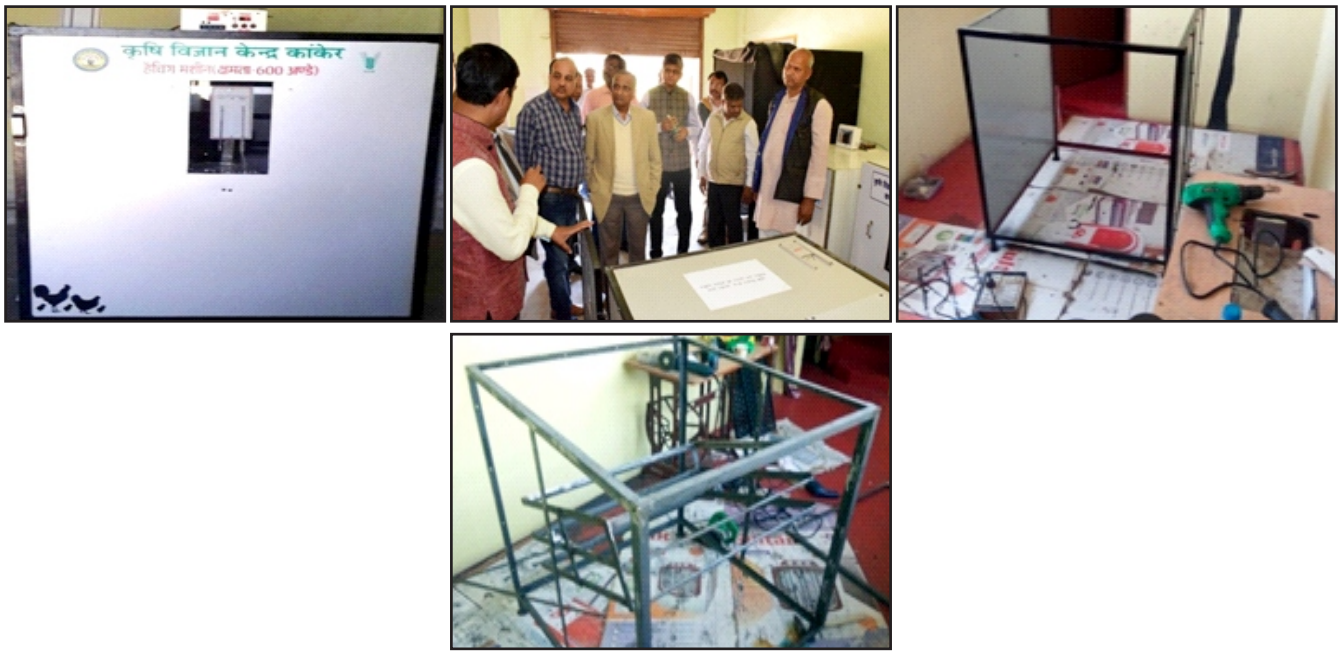


Development of Low cost hatchery machine

Animal Scientist of the KVK, Kanker designed **low cost hatching machine** of 600 egg capacity for the benefit of tribal farmers. The manufacturing cost of the machine is about **Rs. 30,000/-** while in the market same capacity machine are available in **Rs. 1,00,000/-.**

- **Capacity 600 eggs**
- **Fully Automatic**
- **Cost of Machine is Rs. 30000/-**
- **Hatchability of machine is 70-75 %**

Consumption of power is low.



Development of Hygienic Goat Stall Feeding Model

Name of KVK: Korea, Jaspur, Gariaband, Kanker, Raigarh, Durg-II, Balrampur

Horizontal spread of technology

No of village covered	No of farmers	Area in ha or No of units
482	2999	917

Economics of adopted technology

Cost	Gross Return	Net return	B:C ratio
6500	9533	3033	1.46

Goat Farming at KVK Korea

Goat Farming at Farmers field Jashpur

Goat Farming at Farmers field Gariaband

Efficient Rice Bund Management (KVK Surguja)

Average Bund Size	:	1m × 30m
Date of sowing	:	Last week of July (Kharif crop)
Cultivation Technology	:	Intercropping and multitier system
In Kharif season	:	Bottle gourd, Bottle gourd + Okra, Sem, Okra and Marigold etc.
In Rabi season	:	Bottle gourd, Bottle gourd + cabbage, Bottle gourd + Cauliflower, Bottle gourd + Pea, Sem, Bitter gourd, French bean and Strawberry etc.
Marketing	:	Through KVK and Local market

Economics of vegetable cultivation on rice bund on monthly basis

Area of bund (acre)	Income per month	Expenditure per month	Profit per month	B:C ratio
Actual cultivated 0.175	9542	3225	6317	2.96
In 1 acre	54525	18428	36097	2.96





Commercial Production of Ornamental Fishes : KVK Raipur

- ❖ Brought from Kolkata market. Oscar Fish
- ❖ Species are – Yellow Gold, Oranda, Black Moor, Red cap, Subhankin, Angel, Milki carp, Barbs, Parrot, Oscar, Tiger shark, Molley, Swordtail, Guppy.
- ❖ There are 06 breeding pools and 06 small size rearing pools.
- ❖ 09 varieties successfully conducted breeding programmes
- ❖ Glass aquarium are constructed and sold
- ❖ Earning money (2017-18) = 1.33 lacs.

Common Gold Fishes

Oscar Fish

Gulab Jal Production : KVK,Balrampur

कृषि विज्ञान केन्द्र का नाम	उत्पाद का नाम	लागत व्यय (रू./प्रति इकाई कि.	बेचने का मूल्य (रू./कि.)	लाभ (रू./कि.)	वर्ष 2017–18 में कुल माल बेचा गया (कि.)
Balrampur	Gulab Jal	70	120	50	3 lit

Paddy Straw Mushroom cultivation at Janjgir-Champa District

Treatment	Biological Efficiency %	Avg. Days for First Harvest	% change in Days for First Harvest	Net Income (Rs) from q-1 of Used Substrate	B:C Ratio
FP (T1)	16.15	19.75	-	2040	2.02
(T2)	24.3	17.25	12.66	4083	3.04

1 Kg paddy straw bed with size 30 X 20 cm performed better

T2 - Paddy straw bed - 1 Kg paddy straw with size 30 X 20 cm

Models for Doubling of Farmers' income

IFS model at farmers field (2.0 ha) Farmer:Shri Lallu ram, village Aturgaon, kanker Rice + Vegetable + Poultry + Fish-cum-duck + Goatery + Piggery + Animal Hus. + Azolla

	Crop	Area (ha.)	Production (q)	Gross Income (Rs)
Traditional rice alone	Rice	2	76	114000
IFS model	Rice	1.2	54	81000
	Rabi Maize	0.8	56	61600
	Fishery	0.2	60	60000
	Veg. pro.	0.15	78	78000
	Poultry	45 nos		16200
	Piggery	18 Nos		16500
	Goatery	12 Nos		12000
	Total			325300

Economics of lac cultivation in semialata during First Year

Farmer - Prakash Chandra Nishad, Land Holding 0.6 ha, Village - Mohpur

	Crop	Area (ha.)	Production(q)	Gross income (Rs.)	Net Income (Rs)
2016-17(Before intervention)	Paddy	0.6	27	39500	20800
After Intervention	Semialata seed (First year)	0.4	0.12	36000	31000
	Intercropped vegetable (Tomato, cowpea, Coriander, Amaranth, Cauliflower)		40	40000	28000
	Paddy (Kharif)	0.2	12	18000	10200
	Total	0.6		94000	69200


Semialata crop intercropped with vegetable (Planting time – first week of July 2017)

Economics of lac cultivation in semialata during First Year

Farmer - Lakkhu Ram vatti, Land Holding - 0.4 ha; Village - Daspur

	Crop	Area (ha.)	Production (q)	Gross income (Rs.)	Net Income (Rs)
2016-17 (Before intervention)	Finger millet	0.4	5	12500	7100
After Intervention	Semialata seed (1st year)	0.4	0.8	24000	35000
	Intercropped vegetable (Tomato Coriander)		28	56000	39200
	Total	0.4	-	80000	74200


Semialata crop intercropped with vegetable (Planting time – first week of July 2017)

Lac inoculation will be done in July 2018

Horizontal Spread of technology

KVKs	No of village covered	No of farmers	No of trees	Lac production (kg)	Gross return (Rs. In lakh)	Net return (Rs. In lakh)
Dantewada	20	50	1050	5250	5.3	3.2
Kanker	200	4000	5000	25000	25.0	15.0
Korba	80	652	7220	36100	36.1	21.7
Narayanpur	6	16	160	800	0.8	0.5
Raigarh	76	245	630	3150	3.2	1.9
Rainandgaon	4	330	9699	48495	48.5	29.1
Balrampur	47	1310	15720	78600	78.6	47.2
Mahasamund	20	22	2200	11000	11.0	6.6
Gariyaband	3	18	90	450	0.5	0.3
Total	456	6643	41769	208845	208.8	125.3

Technology

Inoculate brood lac @5Kg/plant (Kusum), -3 Kg/plant (Ber); @ 0.5-2.00 Kg /tree (Palash) by using 60 mesh nylon net thereafter spray Ethofenprox 10EC @ 2ml/l + Carbendazim 1gm/l of water, at 30-35 and 60-65 days of inoculation.

Kusum

Galvang

Palas

Ber

कृषकों की आय दुगुनी करने हेतु कड़कनाथ मुर्गीपालन

कृषि विज्ञान केन्द्र में स्थापित कड़कनाथ हैचरी इकाई से चूजे उत्पादन एवं कार्ययोजना

गर्मियों की संख्या	350
उत्पादित अंडे की संख्या	3870
हैचरी इकाई की क्षमता	600
ग्रामों की संख्या	57
प्रदाय चूजों की संख्या	2340

कडकनाथ मुर्गी पालन से लाभ

विवरण	अन्य मुर्गी	कड़कनाथ मुर्गी
मंग दर प्रति किलो	200–250 रू.	500–600 रू.
अंडा दर	05 रू.	10.15 रू.
चूजा	30 रू.	80 रू.
कोलेस्ट्रोल (प्रति 100 ग्राम मांस)	218.12 मि.ग्रा.	184.75 मि.ग्रा.

प्रति इकाई हितग्राही को 25 से 30 हजार वार्षिक आय : जिले हेतु आगामी प्रस्तावित कार्य–विवरण :

क्र.	विवरण	मात्रा / इकाई	दर (रूपये में)	लागत (रूपये में)
1	हैचरी	3000 अंडे की क्षमता	300000.00	300000.00
2	शेड निर्माण	4000 स्क्वेयर फीटू	300.00	1200000.00
3	उपकरण	विभिन्न उपकरण	30000.00	30000.00
4	कड़कनाथ चूजों का मूल्य	2000	80.00	160000.00
5	पक्षियों के लिए भोजन की लागत		550000.00	550000.00
6	अन्य खर्च		50000.00	50000.00
	कुल लागत			22,90,000.00

चूजे का वितरण

उत्पादित कड़कनाथ के अंडे

कृषि विज्ञान केन्द्र में कड़कनाथ मुर्गी पालन　　हैचरी इकाई　　चूजे

Commercialization of traditional scented rice variety - *Jeeraphool* by Tribal Women for doubling Income

Formation of SHGs / FPO of farm women by KVK

S. No.	Name of FPO/SHG	Year	No. of SHGs	Members	Facilitator/Organizer
1	Jaivk Krishi Utpaadak Sahkaari Samiti Maryaadit, Bansajhal (2015)	2015	15	150	KVK Surguja & Govt., Deptt.

Area, Production & Income of Rice / Processed Rice under Organic cultivation

Name of FPO/SHG	Area (Acre)	Production (q)	Income from Rice (Rs. In lakh)	Income from Processed Rice (Rs. In lakh)
Jaivk Krishi Utpaadak Sahkaari Samiti Maryaadit, Bansajhal (2015)	150 (ICM)	1500	30.00	58.50 Lakh

Cost of Rice @ Rs,2000/q and cost of processed Rice (65% recovery) @ Rs. 6000/q

Lokarpan of Mini rice mill by Hon'ble Chief Minister of Chhattisgarh

Visit of Rice processing unit by Hon'ble VC, IGKV

Electronic weighing balance & Bag closure machines) etc.

Economics of Jeeraphool Rice Production

Particulars	Traditional Practices	KVK Intervention
Production Yield of Paddy (q/acre)	06	10
Production Yield of Rice (q/a cre)	3.9	6.5
Income (Rs/acre) Rice@ Rs1800.00 / per quintal (FP) Rs2500.00 / per quintal (RP)	10800.00	25000.00
Income (Rs/acre) Processed Rice@ Rs 4500.00/ per quintal (FP) Rs7000.00 / per quintal (RP)	17550.00	45500.00
Income of Rice@ Rs/ per kg	18.00	25.00
Income of Processed Rice@ Rs/ per kg	45.00	70.00
Net income of Processed Rice@ Rs/ per kg	25.00	45.00

Dissemination Process

IARI, Pusa, New Delhi

IGKV, Raipur

Present scenario of Innovation : Changro Jeeraphool Rice during 17-18

S. No.	Particulars	Status Jeeraphul Rice during 2012-13	Status Jeeraphul Rice during 2016-17	Status Jeeraphul Rice during 2017-18
1	Total Rice area (ha)	285.628	285.628	285.628
2	Total Jeeraphool area (ha)	30	192.134	273.15
3	Total Jeeraphool production (q)	430	4803.00	6342.304
4	Use of Jeeraphool paddy for Milling (q/year)	45	1471.00	1981.97
5	Rice Mill	00	02	02
6	Packaging facility	Nil	Available	Available
7	Sealing machine	Nil	Available	Available
8	Marketing Rate of Rice	19-23 Rs/kg	60-70 Rs/kg	60-70 Rs/kg
9	Marketing Rate of Paddy	12-13 Rs/kg	23-28 Rs/kg	23-28 Rs/kg
10	No. of SHGs	Nil	12	14

Secondary Agriculture: Processing & Value Addition

3.1 Minor Millet

3.2 Red Rice

3.3 Organic Rice

3.4 Tamarind

3.1 Value Addition of Minor Millets

Economics of adopted technology: Rs/100kg

Name of KVK	Technology	Cost	Gross Return	Net Return	B:C ratio
Dantewada & Jagdalpur	**Value addition Minor millets (ragi)**	**13700**	**38500**	**24800**	**2.81**

Promising Characteristics of Technology:

S.N.	Characteristics	Observation (Unit)
1	Finger millet is comparable to rice with regard to protein and fat	protein (6-8%) and fat (1-2%)
2	finger millet contains calcium	0.48mg/ 100gm

Preparation of Ragi Products by WSHG

Livelihood generation through production & value addition of traditional red rice variety by KVK Bastar

SHG – 06 (Total 60 members)

Area – 60 Acre

Variety – Lajani Super

KVK Intervention-

Formation of SHG, Facilitate inputs, Processing & Marketing

Economics of technology adoption

Particulars	Before Intervention	After Intervention
Production/ acre	10	10
Production Cost Value addition & marketing	8800/- -	8800/- 2000/-
Income Details Paddy Rice (65% Recovery) Husk (35 % Husk)	15000/- ----- -----	---- 650X60=39000 350X10=3500
Net Income	6200/-	31700/-
Profit Increase	5 times (411%)	

Processing & value addition of Organic Rice by Combined mini rice mill- Dantewada

Promising Characteristics of Technology:

Characteristics	Observation (Unit)
Capacity	1.5 q/hr
Price of organic rice	50-90 Rs/Kg
Employment generation	365 days/year

Horizontal Spread of Technology:

Name of District	No of village covered	No of units	No of beneficiaries	No of SHG's
Dantewada	150	250	2625	250

Impact of adopted technology

- **Additional income source for farm Woman**
- **More than 2000 farm women get employment**
- **Farmers sell their organic produce at higher price**

Operation of mini rice mill by Woman SHG

Processing and Value addition of Tamarind by KVK Bastar

Intervention	Processing Cost (Rs/q)	Processed Product Price (Rs/q)	% Change	Net Income (Rs/q)	B:C Ratio
Before Value addition	2830	6000	75.00	3170	2.1
After Value addition	10600	28000		17400	2.64

Processing and value addition of tamarind in the form of sweet spiced tamarind candy is effective for fetching higher price as compared to processed product of tamarind brick, hence the technology is recommended for processing of tamarind into tamarind candy.

Popularization of *Deshi* Poultry Bird: Kadaknath
Kadaknath poultry rearing for enhancing income

Journey of Kadaknath	Jhabua to Kanker
Kanker to	In CG. State - Dantewada, Bastar, Balrampur, Bijapur, Narayanpur, Rajnandgoan, Dhamtari, Surguja
	Other state– Maharastra, J&K, Odisha, Punjab

Chicks produced at KVK Kanker – >1 lakh

Promising characters -

Particulars	Kadaknath bird	Other birds
Protein	25%	18-20%
Fat	0.73-1.03%	13-25%
Cholesterol	184.7 mg/100 g	218.1 mg/100 g
Lenoleic acid	24%	21%