Odisha University of Agriculture & Technology
Bhubaneswar

Salient technological recommendations (Agriculture)
State Level Research & Extension Council Meeting 2023-24, OUAT

The followings are some of the technologies discussed during the State Level Research and Extension Council Meeting 2023-24 of OUAT held during 23rd to 25th May 2023 and selected as recommendations for the farmers of Odisha.

A. New crop varieties released for the state

Twelve numbers of varieties from seven numbers of agricultural crops were released by OUAT during the year 2022-23.

Sl. No.	Crop	Variety	Character
Variety released through CVRC			
1	Little Millet	Kalinga Suan 18	• Duration-92 days • Average yield-1688 kg/ha • Suitable for rainfed uplands of Odisha • Resistant to banded blight, leaf blight, smut diseases and moderately resistant to shoot fly
Varieties released through SVRC			
1	Rice	OUAT Kalinga Rice-1 (Kolab)	• Medium duration-130 days • Average yield-5307 kg/ha • Long slender grain • Moderately resistant to blast, sheath rot, brown leaf spot, BPH and gall midge
2	Rice	OUAT Kalinga Rice-2 (Salandi)	• Medium duration- 130-135 days • Average yield-5540 kg/ha • Long bold grain • Moderately resistant to blast, sheath rot, bacterial blight, stem borer leaf folder and WBPH
3	Rice	OUAT Kalinga Rice-5 (Nabanna)	• Early duration variety- 86 days • Average yield-2775 kg/ha • Suitable for rain fed upland • Good aroma, resistant to lodging • Bio fortified variety with 13.6% of protein, 34 ppm of zinc and 8.78 ppm of iron
4	Rice	OUAT Kalinga Rice-6 (Bhargavi)	• Duration- 155 days • Suitable for *rainfed* shallow low land • Average yield- 5009 kg/ha • Moderately resistant to sheath rot, brown leaf spot and blasts • Moderately resistant to leaf folder.
5	Rice	OUAT Kalinga Rice-7 (Barunei)	• Medium duration- 135-140 days • Average yield- 5145 kg/ha • Moderately resistant to sheath rot and blast, • Moderately resistant to BPH.

Sl. No.	Crop	Variety	Character
6	Rice	OUAT Kalinga Rice-8 (Suryashree)	• Medium duration- 125-130 days • Heat tolerant • Average yield - 4257 kg/ha • Suitable for irrigated medium land moderately resistant to sheath blight, blast and gall midge
7	Finger Millet	OUAT Kalinga Ragi-1 (Shreeratna)	• Duration- 117 days • Medium sized light green leaves, top incurved ear heads, light brown seed colour • Average yield-2416 kg/ha. • Non lodging and non shattering • Suitable for *kharif* and irrigated summer • Resistant to brown spot and foot rot , moderately resistant to blast disease , stem borer, aphid and grass hopper
8	Green gram	OUAT Kalinga Green gram-1 (Shreejan)	• Duration- 70 days • Suitable for *Kharif* season • Average yield- 830 kg/ha • Medium long bold pods with green seeds • Protein-21.4%, Zn-33.0 mg, Fe-215.8 mg, Cu-11.8 mg, Mn-15.8 mg • Resistant to MYMV, leaf crinkle virus, moderately resistant to web blight, anthracnose, root rot, powdery mildew, *Macrophomina* blight. • Resistant against white fly and pod borer
9	Ground-nut	OUAT Kalinga Groundnut-1 (Dhara):	• Duration:103-111 days(*Kharif*) • Drought tolerant • Suitable for *Kharif* (rainfed upland), and *rabi* (residual soil moisture) and irrigated summer. • Medium elongated kernels ,light tan testa • 100 kernels wt. -37 g, shelling out turn - 67% • Average pod yield-2408 kg/ha • Protein -27%, oil content- 49% • Moderately resistance to ELS/LLS, rust, *Alternaria* blight, stem rot/collar rot, thrips, jassids, spodoptera and leaf miner
10	Mustard	OUAT Kalinga Mustard-1 (Sampoorna)	• Duration- 110-115 days • Suitable for irrigated medium land • Non-shattering type with brownish-grey and medium size seeds • Average yield- 1337 kg/ha • Oil content 40.3% • Moderately resistant to aphids, *Alternaria* blight, powdery mildew, white rust
11	Sesame	OUAT Kalinga	• Duration- 87-93 days

Sl. No.	Crop	Variety	Character
		Sesame-1 (Ashrit)	• Suitable for irrigated condition in summer season • Synchronous maturity, late shattering capsules • Average yield- 895 kg/ha • Oil content of 45 to 48% • Moderately resistance to *Alternaria* leaf spot, phyllody, powdery mildew, *Cercospora* leaf spot, *Macrophomina* stem and root rot, leaf roller, capsule borer, leaf hopper and mirid bug

B. Varieties released from other institutes and tested at KVKs of OUAT for cultivation in different districts of Odisha

Sl. No.	Crop	Variety	Character/Result	Tested at KVKs	Recommended for the district
1	Paddy	CR Dhan 802	Duration: 139 days Avg. yield; 6500 kg/ha Drought and submergence tolerance	Balasore	Balasore
2	Maize	Pusa Super Sweet corn 1	Duration; 78 days Avg. yield: 13 t/ha (green cob)	Kandhmal Nayagarh Boudh	Kandhmal Nayagarh Boudh

C. Production technologies:

***Nutrient management*:**

1. **Integrated Nutrient Management in greengram:** 75% STD (Soil Test Dose) + foliar spray of NPK 18:18:18 @ 2% at 25 and 40 DAS for higher grain yield and income.(tested at KVK, Angul, Sonepur, Nabarangpur, Ganjam1, Kendrapara, Malkangiri,Keonjhar)
2. **Integrated nutrient management in groundnut:** STD along with application of 0.2LR and *Rhizobium* inoculation @ 50g/kg of seed + PSB @ 5kg/ha +VAM@5kg/ha for increasing pod yield and income.(tested at KVK, Sundargarh-1, Angul)
3. **Integrated nutrient management in sunflower:** STD (RDF: 60:80:60 kg N: P_2O_5:K_2O/ha) +FYM @ 5 t/ha and bio-fertilizer application (*Azotobacter*, *Azospirillum* and PSB, 1:1:1 @ 4 kg each/ha) incubated with FYM for 7 days for higher yield (tested at KVK, Kandhamal, Angul)
4. **Nutrient management in hybrid maize**: Application of Soil Test Dose (STD) of NP & K along with soil application of $ZnSO_4$ @ 25 kg /ha and Borax @ 10 kg/ha for realizing maximum production (RDF: 120:60: 60 kg N: P_2O_5:K_2O/ha). (tested at AICRP on Maize)
5. **Iron toxicity management in Rice**: In iron toxic areas, application of potassium @120kg/ha and cultivation of toxicity tolerant varieties like Kanchan, Indravati, Uphar, Hasant , Ranidhan , Tejaswini and Lalat enables the plant to withstand the toxic effects of iron and sustains the soil health by reduction of exchangeable iron content in soil.(tested at RRTTS, Bhubaneswar)

6. **Application of Nano Urea in paddy**: Substitution of 25% of nitrogen of STD (RDF of 80: 40:40 of N: P_2O_5: K_2O kg/ha) with spraying of Nano Urea @ 4 ml/lit at active tillering and PI stage can produce at par yield as per STD with savings of Urea fertilizer. However, long term soil residual nutrient study is needed for assessing the impact of nano urea on soil health.(tested at IFFCO Chair, OUAT, Bhubaneswar)

Weed Management:

7. **Integrated weed management in Rice:** Weed management in Direct Seeded Rice (Drilled): Pre-emergence application of (Pretilachlor 6% + Bensulfuron methyl 0.6% GR) @ 660 g/ha followed by hand weeding at 20 DAS for effective management of complex weed flora in DSR. (tested at RRTTS, Bhubaneswar & Bhawanipatna)
8. **Integrated weed management in Maize:** Pre-emergence application of Atrazine @ 1.2 kg/ha followed by Tembotrione @120g/ha at 25 DAS effectively controls mixed weed flora in maize crop. (tested at KVK, Nabarangpur, Bolangir, Nuapada, Kalahandi, Koraput)
9. **Moongbean/ Urdbean management in rice fallow**: Seed inoculation with *Rhizobium* + PSB; weed management with Propaquizafop 2.5% + Imazethapyr 3.75% ME @125g/ha at 15-20 DAS and foliar application of NPK(19:19:19) @2% two times i.e. at flower initiation & pod initiation can maximise pod yield of both mungbean and urd bean under rice fallow situation.(tested at AICRP on MULLaRP)
10. **Integrated weed management in *toria***: Pre-emergence application of Pendimethalin 30 EC @ 0.75 kg ha^{-1}followed by rice straw mulch at 12 DAS @ 5 tha^{-1}effectively control the mixed weed flora in line sown *toria*. (tested at AICRP on Rapeseed & Mustard)

D. Protection technologies

11. **BPH management in rice:** Brown Plant Hopper in Rice during *kharif* under rainfed medium land condition is effectively controlled by adopting alley planting / skip row planting (after 3m), installation of spider shed @ 25 nos./ ha and alternate spraying of Flonicamid 50%WG @ 200g/ ha and Pymetrozine 50%WG @ 250 g/ha at 50 & 70 DAT (tested at KVK, Sambalpur, Ganjam-II)
12. **Integrated Pest Management Practice for rice stem borer:** Stem borer in Rice during *kharif* under rainfed medium land condition is effectively controlled by following nursery treatment with Cartap hydrochloride 4G @ 20 kg/ha + alternate spraying of Azadirachtin 3000 ppm @ 1500 ml/ha and Indoxacarb 18.5%SL @ 500 ml/ ha at 55 & 70 DAT respectively and twice release of *Trichogramma chilonis* @ 50,000/ha at 7days after each spraying. (tested at KVK, Malkangiri/ Nabarangpur)
13. **Bollworm complex management of cotton**: To manage the bollworm complex in non-*Bt* hybrid cotton the insecticides viz., Chlorantraniliprole 18.5 SC @ 150 ml/ ha. Pyridalyl 10 EC @ 750 ml/ ha and Emamectin benzoate 5 SG @ 220 g/ ha can be recommended for less pest load and optimum yield. As observed, these insecticides have no adverse effect on natural enemies in the cotton ecosystem.(tested at AICRP on Cotton)
14. **Blast disease management of in rice**: Seed treatment with Tricyclazole 75% WP @ 2.5g/ kg seed + foliar spray of Picoxystrobin 7% + Tricyclazole 20.3% SE @ 1000

ml/ha at the time of appearance of the disease reduces the leaf blast index.(tested at RRTTS, Bhubaneswar)

15. **Sheath blight management in rice**: Spraying of Thifluzamide 24% SC @ 0.8 ml/l twice at 15 days interval starting from initiation of the disease is effective to control sheath blight severity and increase in yield.(tested at AICRP on Rice, Chipilima)
16. **IDM of Bacterial leaf blight (BLB) in rice**: Seedling root dip with *P. fluorescens* @10g/l, first spray with *P. fluorescens* @ 1.5 % at first appearance of the disease, followed by spray with Streptocycline @ 0.01%+ $CuOCl_2$ @ 0.3% and third spray with *P. fluorescens* @ 1.5 % each at 15 days interval reduces the disease severity.(tested at RRTTS, Bhawanipatna)
17. **Management of Sheath rot in Rice:** Sheath rot disease in rice during *kharif* under rainfed medium land condition can be effectively controlled by seed treatment with *Pseudomonas fluorescens* @ of 10g/kg of seed followed by dipping the seedlings in 100 l water mixed with 2.5 kg of *Pseudomonas fluorescens* for 30 minutes. Foliar spraying with Azoxystrobin 23% SC @ 500 ml/ha after appearance of disease symptom (tested at KVK, Bargarh)
18. **IPM practice for Fall Army Worm in Maize:** Fall Army Worm in Maize during *kharif* under irrigated up land condition can be effectively managed by seed treatment with (Cyzapyr + Thiamethoxam) @ 6 ml/ kg seed + Installation of bird perches up to 45 DAS + Foliar application of Tetraniliprole @ 200 ml/ha at 30 days after sowing (DAS) + Whorl application and field placement of poison baits (10 kg rice bran + 2 kg jaggery + 2-3 l of water + 100 g Thiodicarb) at 45 DAS (tested at KVK, Boudh & Jajpur)
19. **IDM of powdery mildew in mung bean**: Foliar spray of Trifloxystrobin + Tebuconazole @ 0.5gm/l three times at 10 days interval starting at disease initiation can reduce the incidence and severity of powdery mildew.(tested at RRTTS, Bhawanipatna)
20. **Root Knot nematode management in transplanted rice**: Soil application of Fluensulfone 2% G @ 1.0 kg a.i/ha in nursery during sowing reduces the nematode incidence both in nursery and main field of rice.(tested at AICRP on PP Nematodes)

E. Farm Machinery Technologies

21. **Bullock drawn four row seed drill for millets:** Bullock drawn 4 row seed drill with inclined plate metering mechanism, output of 0.123 hah^{-1} and field efficiency of 63% can be used for sowing all types of millets. (tested at AICRP on UAE)
22. **Barnyard millet thresher:** The thresher operated with 1 hp motor/ pair of bullock (in rotary mode) with an output of 22.8 $kgh^{-1,}$ threshing efficiency of 97.1%, cleaning efficiency of 95.5% can be used for threshing barnyard millet with average broken percentage of 0.61.(tested at AICRP on UAE)

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Salient technological recommendations (Horticulture)
State Level Research & Extension Council Meeting 2023-24, OUAT

The followings are some of the technologies discussed during the State Level Research and Extension Council Meeting 2023-24 of OUAT held during 23rd to 25th May 2023 and selected as recommendations for the farmers of Odisha.

A. New crop varieties released for the state

Nine new varieties of six horticultural crops as detailed below were released by OUAT during the year 2022-23.

Sl. No.	Crop	Variety	Character
1	Brinjal	OUAT Kalinga Brinjal-1 (Banita)	• 85-90 days to first picking & seed to seed duration is 165-175 days • Suitable for irrigated medium land in rabi & summer season and rainfed upland in *kharif* • Average yield- 34.2 t/ha • Good for cooking and suitable for long distance transport • Resistant to bacterial wilt, moderately tolerant to fruit borer
2	Chilli	OUAT Kalinga Chilli-1(Ragini)	• Days to 1st picking for greenchilli-114 days and ripe chilli -135 days • Suitable for rainfed condition in *kharif* season and irrigated land in other seasons • Average yield of 10.1 t /ha • Protein content- 0.019 mg/ g, vit. C content- 1.28 mg/g • Resistant to bacterial wilt and leaf curl virus
3	Tomato	OUAT Kalinga Tomato-1(Gouri)	• 95-98 days for first picking with fruiting period of 50-65 days • Suitable for irrigated land in *rabi* season • Average yield of 38.3t/ha • TSS -5.0, dry matter-7.1 %, titrable acidity- 0.512 • Good keeping and cooking quality • Resistant to bacterial wilt and moderately resistant to early blight
4	Dolichos bean	OUAT Kalinga Dolichos Bean-1 (Jayakrushna)	• 100-117 days for first picking • Suitable for rainfed condition with light irrigation, *kharif* and post-*kharif* season • Average yield- 10.3t/ha • Protein-0.985 mg/g(pod), 2.91mg/g(seed), vit.C-0.12 mg/g and TSS- 4.4 • Good cooking and keeping quality • Tolerance to pod borer and moderately resistance to leaf spot

Sl. No.	Crop	Variety	Character
5	Ginger	OUAT Kalinga Ginger-1 (Subhada)	• Duration- 220days • Suitable for hills and plains of Odisha both under rainfed and irrigated situation • Average yield of 20.0 t/ha • Oleoresin- 5.4%, dry recovery- 22.4%, essential oil- 1.8% and crude fibre content - 4.3% • Moderately resistant to leaf spot, soft rot, resistant to bacterial wilt • Moderately resistant to shoot borer and scale insect
6	Ginger	OUAT Kalinga Ginger-2 (Sourabh)	• Duration- 218 days • Suitable for hills and plains of Odisha both under rainfed and irrigated situation • Average yield- 18.0 t/ha • Dry recovery is 21.7 %, Oleoresin content is 4.8%, Essential oil content is 1.6% and fibre content is 3.5% (low) • Moderately tolerant to soft rot, bacterial wilt, leaf spot, shoot borer and scale insects
7	Ginger	OUAT Kalinga Ginger-3 (Prayag)	• Duration is 225 days • Suitable for hills and plains of Odisha both under rainfed and irrigated situation • Average yield is 13.7 t/ha • Dry recovery is 20.9 %, Oleoresin content is 3.9%, essential oil is 1.5% and fibre is 5.5% (medium) • Tolerant to soft rot, resistant to bacterial wilt, moderately resistant to shoot borer and scale insects
8	Turmeric	OUAT Kalinga Turmeric-1 (Surangi)	• Duration is 200 days • Suitable for hills and plains of Odisha both under rainfed and irrigated situation • Average yield-23.4 t/ha (fresh rhizome) • Dry recovery is 28 % Curcumin contentis 6.0%, essential oil is 2.1%, and oleoresinis 8.5% • Resistant to rhizome rot, leaf blotch, scale insects and moderately resistant to shoot borer.
9	Turmeric	OUAT Kalinga Turmeric-2 (Gourab)	• Duration- 218 days • Suitable for hills and plains of Odisha both under rainfed and irrigated situation • Average yield 23.1t/ha (fresh rhizome) • Dry recovery is 24.3 %. Curcumin content is 5.9%, essential oil is 3.9%, oleoresin is 13.3% • Resistant to rhizome rot and leaf blotch, scale insects and moderately resistant to shoot borer

B. Varieties released from other institutes and tested at KVKs of OUAT for cultivation in different districts of Odisha

Sl. No.	Crop	Variety	Character/Result	Tested at KVKs	Recommended for the district
1	Cowpea	Kashi Nidhi	Sowing time- last fortnight of July, Seed inoculation with Rhizobium @20 g/kg of seed. Spacing 45x25 cm NPK 20:60:60 kg. Yield advantage of 16 % over FP. FP: Gayatri, Hari	Sundargarh-II	Sundargarh
2	Tomato	Arka Samrat	Triple disease resistant (Leaf curl Virus, bacterial wilt, early blight) Yield advantage of 33%-43.2% over FP: Sakhyam Laxmi	Mayurbhanj-I, Rayagada, Malkangiri	Mayurbhanj, Rayagada, Malkangiri
3	Tomato	Arka Abhed	Duration 140-150 days Multiple disease resistance (Leaf curl Virus, bacterial wilt, early and late Blight). Yield advantage of 21% over FP:-Mithilli	Kendrapara	Kendrapara
4	Tomato	Arka Rakshak	Triple disease resistant (Leaf curl Virus, bacterial wilt, early blight) Yield advantage of 18.98 - 65.8 % over FP:Sakhyam	Ganjam-I, Sambalur Koraput	Ganjam, Sambalur Koraput
5	Sweet potato	Bhu sona	Bio-fortified Sweet potato variety for nutritional security Yield advantage of 9.82-47% over FP (Local Kanda)	Bargarh, Koraput	Bargarh, Koraput
6	Potato	Kufri Khyati	High yielding, early maturing (70-75days), tubers are ovoid, creamy- white with medium deep eyes, Tolerate temperature up to 25 to 28^0 C. Productivity: 24.3% more yield than var. Kufri Jyoti	Jajpur	Jajpur

C. Production technologies

Nutrient management

1. **INM in *Raikia* bean**: Inoculation of native isolated *rhizobium* strain of Phulbani i.e. *Rhizobium pisi* with soil test dose of fertilizer (25:50:20 of N: P_2O_5: K_2O kg ha^{-1}) can be recommended for enhancing yield of *Raikia* bean. (tested at RRTTS, G.Udaygiri)
2. **Integrated nutrient management in Bitter gourd**: Application of 10 ton of FYM per ha, NPK @120:60:90 kg/ha with N in 2 split doses, Azospirillium, Phosphobacter each of 2 kg/ha inoculated with FYM 50 kg at the time of final land preparation for higher yield. (tested at KVK, Sundargarh-II)

3. **Integrated nutrient management in Tuberose:** Application of 75% N (Urea) + 25% N (mustard oilcake) of recommended dose of 200:200:200 kg /ha NPK along with 10t/ha FYM. Results in higher yield and flower size. (tested at KVK, Ganjam-II)
4. **Bunch feeding in Banana**: Blending 15 g of feed mixture (approximately 7.5g of urea and 7.5 g of sulphate of potash dissolved in 100 ml water in 500 g of fresh cow dung) and applying the slurry to the de-navelled stalk-end of bunch soon after fruit set. For higher fruit size and yield. (tested at KVK, Dhenkanal, Bargarh)

Other production technologies

5. **Seed production of parthenocarpic cucumber**: Foliar spray of silver nitrate ($AgNO_3$) at a concentration of 500 ppm during 2 and 4 true leaf stages in parthenocarpic cucumber can be done for initiating more male flower and more seed yield.(tested at AICRP on Vegetables)
6. **Lean to Type trellis in Bitter gourd**: Lean to type trellis – stakes are joined between two adjoining bed forming an "A" shaped structure. Horizontal stakes are installed at the top joining all other beds. Strings are used to secure adjoining stakes. Trellis height is 2m. These type trellies can be used for higher production.(tested at KVK, Jajpur / Bhadrak)
7. **Single Line Trellies System in Cucumber:** Single Line Trellies System in Cucumber by using HDPE Nylon net/ GI wire with bamboo stump in 5 ft distance in line row , 3 ft distance between two rows and by maintaining a trellis height up to 6ft. can be practised for higher yield and ease of operation.(tested at KVK, Kandhamal)

Protection technologies

8. **Fruit fly management in bitter gourd**: The IPM module constituting 'Food Bait @ (20 baits/ha of 100ml each) + Pheromone Trap with Cue- Lure @25traps/ha installed at 20 days after sowing + Foliar spray of spinosad 45 SC @200ml/ha at 45 and 60 days after sowing result in minimum fruit fly infestation and maximum fruit yield.(Bait preparation: mixture of 1kg Cucumber fruit pulp + 50g Gur + 100 ml cow urine+ 0.5 l water and kept for overnight, diluted in 5 l water and added with 10ml Malathion) (tested at RRTTS, Bhubaneswar)
9. **Suitable IPM practice for sucking pest complex in Chilli :**Sucking pest complex in chilli during *rabi* under irrigated medium & up land condition can be controlled by soil application of neem cake @ 2.5q/ha, installing blue and yellow sticky traps each @ 50 nos./ha, spraying of Diafenthiuron 50% WP @ 500 g/ha & Spiromesifen 240 SC @ 300 ml/ha alternately at 10 days interval starting from initiation of the infestation.(tested at KVK, Angul, Balasore and Kendrapara)
10. **Management of Serpentine leaf miner in Tomato:** Management of serpentine leaf miner in tomato during *rabi* under irrigated medium & up land condition can very well be done by growing of seedlings in protected structures, pruning & destruction of affected leaves from the beginning and alternate spraying of Cartap hydrochloride 50% SP @ 1000 g/ha & Spinosad 45% SC @ 165 ml/ha at 10 days interval starting from initiation of the pest incidence (tested at KVK, Angul, Jagatsinghpur)

11. **Disease management in Kalmegh**: Spraying of Tebuconazole 50% + Trifloxystrobin 25%WG @ 500g/ha for managing leaf spot disease and spraying of neem oil 300 ppm @ 2.5l/ha for managing yellow vein leaf curl disease may be practiced for controlling disease complex in Kalmegh.(tested at AICRP on Madicinal & Aromatic plants)

12. **Bio-management of nematode wilt complex in brinjal**: Soil application of pre-incubated *P. fluorescens* @ 2.5 kg along with 2.5 tons of FYM/ha during transplanting reduces the wilt incidence thereby increases the yield.(tested at AICRP on PP Nematodes)

Farm Machinery technologies for Horticulture

13. **Package of equipment for potato cultivation:** Set of equipment like, Tractor operated spading machine, Rotavator for field preparation, Tractor operated paired row vertical belt potato planter for planting, Tractor/ power tiller operated potato digger for harvesting are being recommended of potato cultivation for minimizing cost and drudgery. (tested at AICRP on FMP)

14. **Power operated coconut dehusker:** Coconut dehusker, operated by 0.5 hp single phase electric motor, has a capacity of dehusking 180-200 nuts/h and 900 nuts/day with dehusking efficiency of 94 %. Cost of dehusking by this dehusker is Rs 0.27/nut as against Rs 0.57/nut in manual coconut dehusker. The cost of machine is Rs 16,000/-. (tested at AICRP on FMP)

15. **Casing materials of milky mushroom:** After completion of spawn run, application of loam soil: FYM (1:1) of 1 inch as casing materials (app.500g /bag) to milky mushroom *(Calocybe indica)* grown in bag size of 80cm x 40cm poly bag produces higher mushroom yield with average biological efficiency of 76%.(tested at AICRP on Mushroom)

Allied technologies

16. **Management of competitive moulds in paddy straw mushroom:** Pre-soaking of straw by application of 2% calcium carbonate for 6 hours, dipping the poly bag and wiping the rack with calcium carbonate for management of competitive fungus (*Coprinus/Inkcaps*), decreases mould and increases yield and Biological Efficiency in paddy straw mushroom.(tested at KVK, Sundargarh-I, Ganjam-II, Jagatsinghpur)

17. **Cultivation of blue oyster (*Hyspizygusulmarius*):** Cultivation of blue oyster (*Hyspizygus ulmarius*) have an average yield of 1.85 - 2.2kg/bed with an biological efficiency 92.5- 101% and gives additional income Rs.50-75/bag when produced in a period of low temperature($<20^0$C). (tested at KVK, Sundargarh-I, Bhadrak, Ganjam-I, Jagatsinghpur, Balasore, Mayurbhanj-II)

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Salient technological recommendations (Animal Science)
State Level Research & Extension Council Meeting 2023-24, OUAT

The followings are some of the technologies discussed during the State Level Research and Extension Council Meeting 2023-24 of OUAT held during 23rd to 25th May 2023 and selected as recommendations for the farmers of Odisha.

1. **Area Specific Mineral Mixture (ASMM):** As per the survey and analysis, three types of mineral mixture to be recommended for the different agro climatic zones of Odisha.

i. Region wise mineral deficiency identified:

Region	Agro Climatic zone	Deficient minerals*	District Covered
1	Mid-Central table land zones	Ca, P,Zn, Cu, I, Co	Anugul, Dhenkanal, Cuttack, Bargrah, Jharsuguda, Bolangir, Sonpur, Boudh, Sambalpur
	Western Central table land zone		
2	North Western plateau zone	Ca, P, Zn, Cu, Mn, I, Co	Sundargarh, Deogarh, Balasore, Jajpur, Bhadrak, Puri, Jagatsinghur, Nayagarh, Khordha, Kendrapara, Keonjhar, Mayurbhanja
	North Eastern Coastal plain zone		
	East and south eastern coastal plain		
	North Central plateau Zone		
3	North Eastern Ghat	Ca, P, Mg, Zn, Cu, Mn, I, Co	Ganjam, Gajapati, Rayagada, Phulbani, Kalahandi, Nuapada
	Western Undulating Zone		

*magnitude of deficiency varies region wise

ii. Composition of Area Specific Mineral Mixture for the state of Odisha

Sl. No.	Minerals (%)	ASMM 1 (for region 1)	ASMM 2 (for region 2)	ASMM 3 (for region 3)
1	Calcium	23.00	23.00	23.00
2	Phosphorus	12.00	11.00	11.00
3	Magnesium	-	-	1.40
4	Copper	1.00	1.00	1.50
5	Zinc	0.20	0.40	0.20
6	Manganese	-	0.40	0.20
7	Iodine	0.025	0.025	0.025
8	Cobalt	0.02	0.02	0.02
9	Selenium	0.015	0.015	0.015

*This ASSM to be supplemented @50g/day/cow.

2. **Conception management in Binjharpuri cattle**: Herbal additives (Bael + Curry leaves @ 100 g / day for a week), Vitamin E @ 2g for 60 days along with Area Specific Mineral Mixture (ASMM) @ 50 g/day can be recommended for increasing conception rate in Binjharpuri cattle. (tested at AICRP on NPAERPA)
3. **Bypass fat and mineral mixture feeding for sustained milk production:** Natural **g**razing along with feeding with concentrate + bypass fat @15-20 gm/kg milk/day + Mineral mixture @50g/cow/day increases milk production.(tested at KVK, Bolangir, Dhenkanal)
4. **Floor management on goat sheds:** Plastic slatted sheet as flooring material may be used in goat sheds for better growth and health of the growing kids.(tested at AICRP on Goat)
5. **Feed management in female goat:** Feeding of goat with concentrate feed (crude protein value 12-14%) @ 80-100g/goat/day along with house hold feeding during last two months of pregnancy in female goat.(tested at KVK, Ganjam-I, Keonjhar, Bolangir and Jahrasuguda)
6. **OUAT Kalinga Pallishree poultry breed: "**OUAT Kalinga Pallishree" coloured broiler birds attaining average live weight of 1.7 kg at 6 weeks of age with average FCR of 1.88 can be promoted for both backyard and commercial farming. These birds fetch 20% better market price over the commercial broilers.(tested at AICRP on Poultry)

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Salient technological recommendations (Fishery Science)
State Level Research & Extension Council Meeting 2023-24, OUAT

The followings are some of the technologies discussed during the State Level Research and Extension Council Meeting 2023-24 of OUAT held during 23rd to 25th May 2023 and selected as recommendations for the farmers of Odisha.

1. **Use of Soil and water probiotics in aquaculture:** Monthly application of Soil probiotics (*Rohodococcus, Rodobacter, Nitrosomanas, Nitrobacter* etc.) @ 2.0 litre/ac/metre of water depth/month + Water probiotics (*Bacillus, Lactobacillus, Streptococcus, Aspergillus* etc) @1.0 kg/ac./metre of water depth/month along with usual manuring for better fish growth and health (tested at KVK, Puri, Bhadrak, Nayagarh)
2. **Ivermectin for control of *Argulus* disease in fishes:** Application of Ivermectin 2 % w/w @ 250 gm/ ton in fish feed @ 5-3% of body weight daily for 4-5days effectively controls *Argulus* in fishes (tested at Puri, Bhadrak and Kendrapara)
3. **Freshwater Prawn (*M. rosenbergii*) with Grass Carp in mixed culture practice:** Stocking of Freshwater Prawn post larvae @10000nos., Grass Carp Fingerling @ 500 nos, Catla @ 3000 nos., Rohu @ 2000 nos. per ha (no stocking of Mrigal & Common carp) increases fish yield and farmers' income. (tested at KVK, Nayagarh)
4. **Incorporation of Amur carp in composite carp culture:** Stocking of Amur Carp with partial (50%) replacing with Mrigal (bottom feeder) for better fish production and feed utilization. (tested at KVK, Nayagarh, Bhadrak, Jagatsinghpur, and Ganjam-II).

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