

Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth
Dapoli 415 712, Dist. Ratnagiri
RESEARCH RECOMMENDATIONS OF 2018

Crop Varieties developed by the University :

1) Cinnamon – Cassia salient features

- First variety of Cassia
- Average bark yield (fresh) - 232 g/plant (dry) - 108 g/plant
- Average dry leaf yield - 230.67 g/plant
- Period of harvesting - November to May
- Volatile oil - 2.40 %
- Coumarin content- 19.9 mg/kg
- Low level of coumarin content 19.9 mg/kg and bark oil 2.40 %

2) Nutmeg - Konkan Sanyukta

- Leaf characters - Length 11.20 cm, Breadth 6.20 cm, Leaf area 40.75 cm²
- Average yield - 500 fruits/plant/year, Weight of fruit - 75.70 g, Fresh wt of nut 14.22 g and Dry wt of nut 9.20 g and oil 27%
- Days require for fruit maturity - 270 days
- Harvesting period – July to August
- Fresh wt of mace 3.90 g and oil 17.75%, Dry wt of mace 1.07 g.

3) Rice – BARCKKV-13 (Trombay-Karjat Kolam)

- Average grain yield 4.0 to 4.5 t/ha
- Dwarf stature and non-lodging, Midlate (130 to 135 days), Short slender grain type and Moderately resistant to stem borer
- This culture has recorded 18.95 per cent increased in grain yield over check Karjat 4
- High milling (73.7%), head rice recovery (67.98%) and translucent kernel type indicating superior grain quality of rice variety BARCKKV 13 with acceptable amylose content (23.09)

Farm Equipments / Implements released :

1) Cono Weeder

Women friendly ergo refined Dr. B.S.K.K.V. cono weeder is recommended for weeding in paddy field.

Recommendations based on crop production technologies:

A) Natural Resource Management:

Soil fertility and plant nutrition-

1. It is recommended to apply higher dose of fertilizers 3000:1000:1000 g, N: P₂O₅ : K₂O along with 50 kg. FYM to above 10 year/plant for getting higher yield and B:C ratio in Alphonso mango under lateritic soil of Konkan region.
2. It is recommended to apply Konkan Annapurna Briquettes 175 kg/ha to Kharif rice for getting higher yield and economic returns due to balanced supply of nutrients throughout the crop growth period
3. For getting higher yield of cashewnut, it is recommended to apply two sprays of 0.1% CuSO₄ + 0.05% lime, one each at flowering and fruit set along with recommended dose of fertilizers in lateritic soils of konkan.

Rainfed and dryland field crops-

1. It is recommended to grow rice hybrid sahyadri-3 in kharif season by sowing the nursery during 23rd meteorological week (4th to 10th June) and transplanting 15 days old seedlings for obtaining higher yield and net returns under South Konkan conditions.
2. For obtaining higher yield from sugarcane in South Konkan region, it is recommended to use the seedlings of single bud set grown in the media comprising of coco-peat and vermi-compost in 1:1 proportion along with *Acetobacter* culture @ 5.00 g per kg.
3. It is recommended to grow okra in Red ferrogenous Soil of Konkan region at a spacing of 120 – 45 × 15 cm in paired row under drip irrigation with plastic mulch and be irrigated daily by following the given schedule with RDF (100: 50:50) through WSF in seven equal weekly splits through drip irrigation to achieve higher productivity and economic returns.

Crop period (weeks)	Water application (Lit/m length)
1 to 5	52
6to 9	50
10 to 13	75
14 to 17	47

Integrated Farming System-

1. Sahyadri -3, Sahyadri-4, Sahyadri-5, Karjat-3, Karjat-5, Karjat-8 and Ratnagiri-3 rice hybrids/varieties are recommended to grow under organic package for getting higher yield and economic returns during Kharif season.

Groundnut varieties konkan Gaurav, TG 26 and JL 776 are recommended to grow under organic package for getting higher yield and economic returns during Rabi-hot weather season.

2. It is recommended that rice- groundnut, rice – sweet corn and rice – dolichos bean systems be grown under organic package of practices to get higher yield and economic returns from rice based cropping systems.
3. In North Konkan Coastal Zone for higher productivity and profitability from Kharif Rice- Rabi Cowpea system, it is recommended that both crops be supplied with 75 % RDF, crop residue @ 2 t and PSB @ 3.5kg ha¹ along with Glyricidia green leaf manuring @ 3 t and *Azospirillum* @ 3.5 kg to rice and *Rhizobium* @ 3-5kg ha⁻¹ to cowpea, respectively.

Micronutrients-

1. It is recommended that the application of 20 kg MgSO₄, 12.5 kg ZnSO₄ 10 kg Borax through soil and foliar spray of FeSO₄ @ 0.5% nutrients along with recommended dose of fertilizer (FYM @ 10t +100:50:100 kg NPK ha⁻¹) to get higher tuber yield and more economic returns from cassava in Konkan region.

B) Horticulture:

1. For getting higher retention, yield and reducing spongy tissue per cent, spraying of solution containing combination of derivatives of L-Ceystein (N-ATCA) (10%) and Folic acid (0.2%) at 50% flowering (1 ml per liter of water), pea stage (1.5 ml/ liter), egg stage (2 ml/liter) and at 75 days after fruit set (2 ml/liter) is recommended.
2. For getting higher retention and yield in cashew, spraying of solution containing combination of derivatives of Thioproline (5.0%), Folic acid (0.1%) and Brassinolides (500PPM) at nut set (1 ml per liter of water), 15 days after 1st spray (1.5 ml/liter) and 15 days after 2nd spray (2ml/liter) is recommended.

3. It is recommended to cultivate cinnamon, nutmeg, black pepper, banana and pineapple as an intercrop under Konkan agro-climatic condition, for getting the higher yield and returns from coconut based multistoried cropping system.
4. It is recommended to grow Banana + Pineapple + Elephant foot yam as mixcrop to get early returns in young Oil Palm garden (up to 5 years) under South Konkan region.
5. To get more success and good growth of nutmeg and kokum grafts and black pepper cuttings it is recommended to use closed propagation chamber for propagation.

C) Animal and Fisheries Sciences :

1. It is recommended that the supplementation of fresh *Azolla pinnata* @ 1.5 kg. with concentrate feed for improving growth rate of crossbred calves.
2. It is recommended to apply 2 % of buffalo dung (dry) as organic manure in mixture of sand and soil in the ratio of 1:1 as a fertilizer media under 800 lux light intensity for better lengthwise growth and biomass of aquatic plant, *Vallisneria*.
3. It is recommended that the Sword-tail seed (*Xiphophorus hellerii*) should be stocked at the rate of 150 number/ m² in a cage placed in rain-fed farm-ponds and fed at the rate of 8% of body weight having 32 % protein for better growth.
4. It is recommended to use shatavari powder at the rate of 3 % in the *Fifoo* feed developed by Dr. BSKKV for better growth of Guppy (*Poecilia reticulata*) fishes.
5. It is recommended to incorporate the *Spirulina* powder at the rate of 3 % as a feed supplement in the diet of (*Oreochromis niloticus*) for better growth.
6. It is recommended to mix 2 g/kg of dry banana powder as prebiotic with 0.5 g/ kg of any probiotic in the feed for better growth and survival of *Catla* fry
7. It is recommended to mix 2 g/kg of dry banana powder as prebiotic with 0.5 g/ kg of any probiotic in the feed for better growth and survival of *Tilapia* fingerlings
8. It is recommended to use 33% *Enteromorpha* supplemented feed @ 5% for better growth and survival of rabbit fish (*Siganus canaliculatus*) fry
9. It is recommended to use brackish water of 0 – 5 psu salinity for seed production of *Tilapia* in coastal areas.

D) Basic Sciences, Biochemical & Biotechnology

Plant, Animal and Fish Biotechnology-

1. Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth developed tissue culture technology recommended for micropropagation of Red banana.

Food Science and Technology-

2. It is recommended of prepare most acceptable quality ginger shrikhand having shelf life of two days at ambient atmospheric conditions and six days at refrigerated conditions, as per method developed by DBSKKV, by using mix youghurt culture of *Streptococcus thermophilus* & *Lactobacillus bulgaricus* @ 1% of original milk (w/w) and by addition of ginger juice as flavouring agent @ 5.0% (w/w) of chakka.
3. Process developed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth for preparation of edible film from 15 % cassava starch is recommended.
4. Process developed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth for preparation of edible film from 15% Jackfruit seed starch is recommended.
5. Process developed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth for preparation of Soy milk fortified with cow milk (25:75), paneer cubes is recommended.
6. Process developed by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth for preparation of dehydrated Soy milk fortified with cow milk (25:75), paneer cubes of 50°C by microwave convection dryer is recommended.
7. It is recommended to prepare the lemonade cashew apple spicy nectar by using 20 per cent cashew apply juice, 3 per cent lime juice and 1 per cent ginger juice with maintaining 15 °B TSS as per the process developed by Dr. BSKKV Dapoli.
8. Suvarna variety released by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, is recommended for preparation of processed bottled mango pulp.
9. It is recommended to use batter developed by Dr. B. S. Konkan Krishi Vidyapeeth Dapoli for preparation of less fat containing and good quality Pangasius fish fingers “Pankaj” for consumption.
10. It is recommended to prepare most acceptable quality chhana podo, having shelf life of four days at ambient atmospheric conditions , as per method developed by DBSKKV, Dapoli from buffalo milk by addition of alphonso mango pulp @ 20 % of chhana (W/W)

11. It is recommended to prepare most acceptable quality kalakand, having shelf life of six days at ambient atmospheric conditions and ten days at refrigerated conditions as per method developed by DBSKKV, by incorporation of kesar Mango pulp @ 7.50 % (W/W) of initial quantity of milk.
12. It is recommended to prepare most acceptable quality mango milk pudding . having shelf life of ten days at refrigerated conditions, as per method developed by DBSKKV, by using gelatin as stabilizer @ 2.0 % and alphonso mango pulp as flavouring agent @ 15% of original milk (w/w).
13. It is recommended to prepare most acceptable quality Pantua. having shelf life of 12 days at atmospheric conditions and 16 days at refrigerated conditions, as per method developed by DBSKKV, by incorporation of date (*Phoenix dactylifera* L.) paste @ 20 % of pantua mix (w/w) and soaking for a period of 5 hrs. in sugar syrup.

E) Plant protection

Plant pathology-

Phytosanitation along with soil application of *Trichoderma harzianum* @ 250 g/plant combined with three sprays of Bordeaux mixture (1%) first sprays at the onset of monsoon, followed by two sprays at monthly interval are recommended for economical management of *Phytophthora palmivora* fruit drop of sapota, in Konkan region of the Maharashtra state.

Agricultural Entomology-

1. The application of recommended dose of fertilizers + azadiractin + micronutrients (Boron, Manganese, Molybdenum) through briquettes is recommended for the integrated management of coconut eriophyid mite. The briquettes should be applied @ 4.5 kg/palm/year in three splits in the months of June, October and February.
2. For management of mango hopper it is recommended to spray buprofezin 25SC @ 0.05% (2ml/lit) at the time of third spray in the University recommended spray schedule.
3. For management of cashew apply and nut borer it is recommended to spray (0.05%) of Dichlorvos 76 EC 10ml/10lit of water after the initiation of infestation.

4. For the management of rice stem borer and leaf folder, two applications of granular insecticides Cartap hydrochloride 4 G @ 18.75 kg per ha are recommended. The first application be given in the nursery 2-3 days before transplanting followed by second application at 30-35 days transplanting or as per the requirement.

F) Agricultural Engineering –

Agri Processing Engineering-(Farm Structure and EOS)

1. The Process Technology for preparation of “KKV Crisp” using Twin Screw Extruder from maize, rice and horse gram in the proportion of 50:30:20 is recommended.
2. DBSKKV developed ‘Bamboo Kutir ‘ technology is recommended for Agro Tourism.
3. Dr. B. S. K. K. V. Developed combine unit of carbonization and liquefaction of biomass is recommended to produce biomass charcoal and crude bio-oil.

Soil and water conservation Engineering-

4. The DBSKKV Developed low cost real time soil moisture sensor based irrigation controller is recommended for irrigation of various crops.
5. It is recommended to irrigate the shallow and deep rooted crops in lateritic sandy clay loam soils of konkan region by installing subsurface lateral at 15 to 30 depth according to crop root zone depth.

Farm Machinery and Power-

1. Indirect method of predicting oxygen consumption rate from the calibration charts is recommended to use (with ± 10 per cent error) The following equations are recommended to predict oxygen consumption rate (VO_2) From heart rate for different age groups of male and female workers of Dapoli region.

Age group Years	Equation	Correlation coefficient (r value)	Regression Coefficient (R^2)
Male			
18-30	$OCR=0.019HR-1.2788$	0.91	0.83
30-40	$OCR=0.0195HR-1.2814$	0.90	0.81
40-50	$OCR=0.0208HR-1.4861$	0.95	0.90

Female			
18-30	OCR=0.0123HR-0.8443	0.93	0.86
30-40	OCR=0.0125HR-0.8724	0.93	0.86
40-50	OCR=0.0122HR-0.8386	0.90	0.81

OCR-Oxygen Consumption Rate

HR- Heart Rate

G) Social Sciences :

Agril. Economics-

1. Mango growers apply plant protection chemical indiscriminately and incur extra expenditure of Rs. 5718/ha. It is recommended to educate mango growers to follow plant protection schedule of the University through extension agencies for cost minimization and reduce negative externalities of chemicals.
2. A) In Konkan region the post-harvest losses in mango estimated to Rs. 1100/- crores. Hence. It is recommended to set up mechanical post-harvest unit for mango at tehsil places.
B) In South Konkan region regulated market is existed for Ratnagiri and Sindhudurg district. However considering increase in the area under mango in these two districts it is recommended to establish market yard for mango under APMC in each tehsil.
C) It is recommended to train the farmers through extension agencies regarding changes in post-harvest handling and marketing management in mango.
3. After 7 years if rejuvenation of old and senile mango orchards in South Konkan region, per hectare incremental yield was 29.31 q. and incremental net returns were Rs. 53,189/- Similarly, per hectare saving in expenditure on labour of spraying and harvesting of fruits was 32.10 per cent. Therefore, it is recommended that mango growers in producing area be trained by extension agencies to adopt rejuvenation technology of mango orchards of DBSKKV, Dapoli for higher yield and gross income.
