



e- kalpa: Coconut information on your fingertips

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Indian farming is challenging in the face of preponderance of small and marginal holdings. Coconut based homesteads showcase the potential for technology integration and innovations in integrated farming system. But this requires timely and need based information support. The most potential Information Communication Technologies (ICT) tools are mobile phones which are reflected in the national level overall tele density in the urban and rural areas as reported by the Telecom Regulatory Authority of India (TRAI) in 2017 as 172.28% and 57.55% respectively. The overall tele density of states such as Kerala (115.67%), TamilNadu (128.97%), Andhra Pradesh (97.54%) and Karnataka (113.43%) are on the higher level. This mobile penetration and internet access in these major coconut growing states of India can be considered as a strong indicator of the suitability and need for the Information Communication Technologies (ICT) in coconut development sector which is predominated

by the small production systems. Considering the above factors Indian Council of Agricultural Research – Central Plantation Crops Research Institute has developed an interactive cloud based hybrid mobile app for the benefit of coconut farmers.

Coconut farmers often find it difficult to acquire knowledge in cultivation and get timely advisories for their field problem from various sources. Information Communication Technologies could resolve these problems to a greater extent in a desired manner. Even though farmers are able to gather information on scientific coconut cultivation practices and other need based advisories from several sources, there is need for the same under a common umbrella whenever they wanted. Indian Council of Agricultural Research – Central Plantation Crops Research Institute (ICAR- CPCRI), the premier institute in India conducting research and outreach programs on Coconut, Arecanut and Cocoa, has

developed an Android mobile application 'e- kalpa' for catering to the multiple information needs of farmers of coconut growing states. Farmers can download e- kalpa, free of cost from Google Play store and utilize the scientific information both online and offline modes.

Know about e- kalpa: the mobile App

e- kalpa provides information as technology

snippets which are available in 'Knowledge base'. The technology snippets can be accessed in multi lingual mode- English, Malayalam, Kannada and Hindi.

a. How to install e- kalpa: e- kalpa could be installed from Google play store in Android mobile phones by anyone free of cost. Type e- kalpa in Google play store and download. Once downloaded, it is accessible in offline mode also. Presently more than 3000 farmers have downloaded this application.

1.	Coconut recipes for micro entrepreneurs	i) Coconut chutney powder ii) Coconut laddoo iii) Mature coconut water squash iv) Coconut candies v) Coconut vinegar vi) Coconut pickle vii) Coconut water ready to serve
2.	Coconut based farming systems and soil/moisture conservation methods	i) Coconut based high density multi species cropping system (HDMSCS) ii) Coconut based mixed farming system iii) Glyricidia alley cropping iv) Growing of inter crops in coastal sandy soil with soil and moisture conservation measures v) Intercropping of medicinal plants in coconut garden
3.	Coconut based mushroom cultivation, flower cultivation	i) Commercial cultivation techniques of Heliconia stricta in coconut gardens ii) Growing edible mushrooms on coconut residues iii) Intercropping Marigold and Gomphrena in coconut garden
4.	Coconut varieties	i) Chandrakalpa ii) Chandralaksha iii) Chandrasankara iv) Chowghat Orange Dwarf v) Kalpadhenu vi) Kalpaharitha vii) Kalpajyothi viii) Kalpamithra ix) Kalpapratibha x) Kalparaksha xi) Kalpasamrudhi xii) Kalpasree xiii) Kalpasreshta xiv) Kalpasurya xv) Kalpatharu xvi) Kerachandra xvii) Kerakeralam xviii) Kerasankara
5.	Diseases and management	i) Bud Rot disease ii) Immature nut fall iii) Leaf blight or grey leaf spot disease iv) Root (wilt) disease v) Stem bleeding disease vi) Thanjavur wilt/ Ganoderma wilt/ Basal stem rot disease vii) Boron deficiency symptoms and management in coconut viii) Leaf rot disease
6.	Fertilizer application methods	i) Biofertilizers ii) Coir pith composting iii) Drip fertigation in coconut iv) Integrated nutrient management in coconut v) Nutrient deficiency symptoms and their management in coconut vi) Soil sampling in coconut vii) Vermicomposting of fallen coconut leaves viii) Boron deficiency and its management in coconut
7.	Harvest and post harvest technologies	i) Agricultural waste fired coconut chips dryer ii) Agricultural waste fired virgin coconut oil cooker iii) Coconut chips dryer (electrical) iv) Coconut pulverizer v) Coconut testa removing machine vi) Coconut de-shelling machine vii) Coconut milk expeller with cooling mechanism viii) Coconut slicing machine (electrical) ix) Coconut slicing machine (manual) x) Device to collect unfermented fresh and hygienic Neera xi) Double screw coconut milk expeller xii) Manually operated coconut milk extracting machine xiii) Safety attachment to paddle type coconut climbing device xiv) Shell fired copra dryer xv) Snowball tender nut machine xvi) Tender nut punch and cutter xvii) Virgin coconut oil cooker (Biogas/ LPG)
8.	Pests and management	i) Coreid bug ii) Eriophyid mite iii) Leaf eating caterpillar iv) Red palm weevil v) Rhinoceros beetle vi) Rodents vii) Slug caterpillars viii) White grub

Features of e- kalpa

- Cloud based Android mobile application
- Accessible both in offline and online modes
- Available free of cost from Google Play store
- Multilingual
- Interactive application (with scientists)
- Real time reporting of field problems and timely advisories
- Handy tool for farmers, farmer producers organizations, extension officials and other stakeholders

Components of e- kalpa

Language settings: You can select any of the language of your choice from the available language options and get needed information. You may also look into other languages since addition of technology snippets are in progress.

Knowledge base: In knowledge base, details are available for Coconut, Arecanut and Cocoa. When you touch the option on Coconut, technology details are available in Table :1:

Likewise information/technology snippets are

also available for Arecanut and Cocoa along with color photographs for easy access and utilization.

Crop information component: As per the feedback and need expressed by the users of e-kalpa for brief information capsules on inter and mixed crops, the component of ‘Crop information’ was made available. This attains importance since coconut is cultivated mostly as homestead farming system. The crop information contains spacing, seed rate, season of planting, quantity of farm yard manure/ compost and other fertilizers to be applied for the crop. The information for the following crops are available from crop information of e kalpa.

Beverage crops	Arecanut, Beetle Nut, Cocoa
Cereals and millets	Paddy, Ragi/ Finger Millet
Cool season vegetables	Beetroot, Cabbage, Carrot, Cauliflower, Onion, Palak
Cucurbitaceous vegetable	Ash Gourd, Bitter Gourd, Bottle Gourd, Cucumber, Oriental Pickling Lemon, Pumpkin, Ridge Gourd, Snake Gourd, Watermelon
Flower crops	Jasmine, Marigold
Fodder crops	Desmanthus, Fodder Grass, Fodder Maize, Fodder Sorghum
Fruit crops	Banana, Jack Fruit, Mango, Papaya, Pineapple, Rambutan
Oil seed crops	Coconut, Ground Nut, Sesame
Other vegetables	Amaranthus, Clove Beans, Dolichos Beans, Okra
Pulse crops	Cow Pea, French Beans, Horse Gram
Solanaceous vegetables	Brinjal, Chilli, Tomato
Spice crops	Black Pepper, Ginger, Nutmeg, Turmeric
Tuber crops	Amorphophallus, Chinese Potato, Colocasia, Greater Yam, Lesser Yam, Sweet Potato, Tapioca

This feature enables farmers or extension officials or any other concerned stakeholders the basic information on 70 crops in the system with a gentle touch on the mobile phone screen.

Input Calculator

For fertilizer application in a coconut garden, the farmer has to be aware of the age of the palm and the bearing nature for calculating the total fertilizers required for his coconut plot. In e kalpa the ‘Input Calculator’ provides the required quantity of organic manure, Lime/ Dolomite, Urea, Rajphos, Muriate of Potash and cowpea for young plants up to one year of planting, one year after planting, 2 years after planting and 3 years and onwards. In the opening

window the farmer has to enter the number of palms in each category in his garden and touch the next button. He will get a detailed report specifying the total quantity of fertilizers for each category of palms in his plot. The points to remember for the integrated nutrient management for the coconut palms on which schedule, frequency are also available in the input calculator.

Online features in e-kalpa - The facilities available in the online mode are as follows.

Real time reporting and facilitation of field problems of coconut farmers:

Facilities for real time reporting of field problems in the coconut plots itself are available in e- kalpa. For problem diagnosis and advisories from ICAR -CPCRI, farmers can use e- kalpa in a simple format. When you open online facilities of e- kalpa, you can see the component ‘Farmer support’. When you touch this icon a window for reporting the field issues will appear. The farmer can take the picture or video from his field itself and can upload them. Touching the tick mark, it will reach CPCRI within seconds. The farmer could receive the response and advisories as early as possible.

Handy Tool for Coconut Producers Society (CPS) and Extension Officials:

More than 9000 Coconut Producing Societies (CPS) have been registered under Coconut Development Board, clustering the small and marginal coconut farmers. One of the primary goals of the CPS is utilizing scientific technologies involving coconut farmers to improve their production, processing and marketing process as a group. e-kalpa could be used for outreaching the farmers with technologies and information at their fingertips, right in their field.

The technology snippets and the information furnished in the mobile application of ICAR-CPCRI is the collation of the research output and outcome from all the divisions of the institute, over the years in a single platform. Information and technologies are also important as production factors in farming. Information Communication Technologies (ICT) enables extension and research organizations to reach the society economically faster and ensuring responsibility. Hence the coconut farmers are requested to utilize this simple mobile application for improving their farm productivity through knowledge application, since farming is time critical and information intensive. ■

[Link address of e-kalpa: https://goo.gl/b3GTk0](https://goo.gl/b3GTk0)