

## Varieties developed from UHS, Bagalkot

### 1. Drumstick- Bhagya (KDM-01)



ಸುಗ್ಗೆ ಕಡಲೆ ಕೆ.ಡಿ.ಎಮ್-೦೧ (ಭಾಗ್ಯ)

| Features/Characteristics  |   |
|---------------------------|---|
| Plant Height              | 2.5 to 3.0 m  |
| Flowering                 | 130 to 140 days   |
| Pod length                | 65 to 70 Cm   |
| Average no. of seeds /pod | 18.8  |
| Pod weight                | 154.75 g  |
| Yield                     | 300 to 350 pods /year (I year)<br>800 to 1000 pods /year (Subsequent years) |
| Yield /Acre               | 17 to 20 Acre (42-50 t/ha)  |
| Leaves and Pod            | Rich in Vitamin C, iron   |

## 2. Chilli - GCS/94-68



| Features/Characteristics      |  |
|-------------------------------|--|
| Plant Height                  | >70 to 75 cm   |
| Fruit length                  | >8-9 cm  |
| No. of fruits / plant         | 122-180  |
| Av. Fruit weigh (g)           | 0.28   |
| Morphological characters      | <ol style="list-style-type: none"><li>3. Erect plant</li><li>4. Light parrot green coloured leaves</li><li>5. 40-42 days for 50% flowering</li></ol> |
| Tolerance to pest and disease | <ul style="list-style-type: none"><li>• Tolerant to Powdery mildew and fruit rot disease</li><li>• Less incidence of Thrips and Mites</li></ul>      |
| Yield (Green chilli)          | 56 q/Ac (140 q/ha)   |

### 3. Capsicum - Apoorva (CP-40)



| Features/Characteristics |                                    |
|--------------------------|------------------------------------|
| Plant Height             | 63.10 cm                           |
| Days to 50% flowering    | 42.17                              |
| No. of seeds /fruit      | 178.20                             |
| No. of fruits / plant    | 15.83                              |
| Av. Fruit weigh (g)      | 23.33                              |
| Yield                    | 4.64 t/Ac (11.86 t/ha)             |
| Pungency                 | mild                               |
| Fruit colour             | Light green                        |
| Ripe fruit colour        | Red                                |
| Fruit quality            | Rich in Vitamin C (127.77 mg/100g) |

#### 4. Chrysanthemum - Dundi.



| Features/Characteristics    |  |
|-----------------------------|--|
| Plant Height                | 50-55 cm   |
| No of branches /plant       | 10-15  |
| No of suckers/plant         | 12-14  |
| Flower weight               | 1.75 to 2.25 g   |
| Flower diameter             | 4 to 6 cm  |
| Shelf life                  | 2 to 3 days  |
| Flower yield                | 5.2 t/AC (13 to 15 t/ha)   |
| Morphological characters    | Flowers are Yellow in colour, round in shape, more attractive than Karnool variety |
| Disease and Pest resistance | Moderately susceptible to <i>alternaria</i> leaf spot                              |
| Special feature             | Flowering is seen even during Off season (December)                                |

## 5. Coconut-Kalpatharu



| Features/Characteristics       |                       |
|--------------------------------|-----------------------|
| Plant Height                   | 6.38 m                |
| No of leaves                   | 32                    |
| Crown shape                    | Circular              |
| No. of inflorescence / year    | 12.40                 |
| No. of nuts/year               | 91.50                 |
| Bearing habit                  | Regular               |
| Copra content                  | 172.40 g/nut          |
| Copra yield /palm/year         | 15.88 kg              |
| Copra yield                    | 1.11 t/Ac (2.78 t/ha) |
| Oil content                    | 67.2%                 |
| Oil yield                      | 1.87 t/ha             |
| Lauric acid content in oil (%) | 44.7                  |
| Quantity of water              | 270 ml                |
| Sweetness of water and meat    | Good                  |
| Total Sugar content            | 4.93%                 |

### Fruit characters:

|                                    |          |
|------------------------------------|----------|
| 1. Shape of fruit                  | Oval     |
| 2. Colour of fruit                 | Green    |
| 3. Breadth of fruit                | 14.21 cm |
| 4. Length of fruit                 | 20.81 cm |
| 5. Weight of nut                   | 640 g    |
| 6. % of husk of whole fruit weight | 33.20    |

### 6. Black pepper- Adimane (Accession No.53)



| Features/Characteristics       |  |
|--------------------------------|--|
| Performance                    | Suitable for Arecanut mixed cropping system  |
| Resistance to pest and disease | <ul style="list-style-type: none"><li>• Tolerant to <i>Phytophthora</i> wilt</li><li>• Low incidence of thrips and snails (&lt;5%)</li></ul> |
| Yield                          | High yielding (2.21 kg dry berry/ vine)  |
| Spike length                   | 12-13 cm   |
| No. of Berry /spike            | 80   |
| Dry recovery of Berry yield    | 28%  |
| Oleoresin                      | 7.8%   |
| Piperine                       | 3.2%   |
| Oil                            | 2.8%   |

## 7. Arecanut

A) A-1/266



**Arecanut Mother Tree**



**Fresh nuts**

| Features/Characteristics |                                   |
|--------------------------|-----------------------------------|
| shape of nut             | Flat                              |
| Foliage                  | Umbrella shape                    |
| Bunch                    | compact and synchronized maturity |
| Bearing                  | Regular                           |
| Nut Maturity period      | 230-250 days                      |
| Chali nut yield          | 6.22 kg/palm                      |

B) A-1/266



**Mother Tree**



**Fresh nuts**

| Features/Characteristics |                          |
|--------------------------|--------------------------|
| shape of nut             | Oval round               |
| Foliage                  | Umbrella shape foliage   |
| Bunch                    | compact and synchronized |
| Bearing habit            | Regular                  |
| Nut Maturity period      | 230-250 days             |
| Chali nut yield          | 6.13 kg/palm             |

## 8. Garlic (AAS-2)



| Features/Characteristics |                                   |
|--------------------------|-----------------------------------|
| Crop duration            | 105 (96 -110 days) short duration |
| Colour of clove          | Pinkish                           |
| Cloves/bulb(No.)         | 20.10                             |
| Bulb weight              | 10.33 g                           |
| Bulb Yield               | 27.91 q/Ac (69.79 q/ha)           |

## 8. Sapota DHS-1/2-1 (DHS - 2/1)



| Features/Characteristics           |  |
|------------------------------------|--|
| Growth habit                       | Tall & vigorous growing wide drooping branches       |
| Leaves                             | Light green, long and elliptic lanceolate            |
| Fruit                              | Oval-egg shape (2-3 fruit in cluster)                |
| Fruit pulp                         | Soft and sweet (22-23% TSS) with light orange colour |
| Keeping quality                    | good   |
| Fruit wt                           | 75-80g   |
| Average Yield (Full bearing stage) | 251.3kg/Tree   |

## Technologies developed

CROP IMPROVEMENT: Varieties adoption for different Zones (Based on evaluation trial result)

### 1. Potato:

- **Kufri Gourav (Jx576):** Gave 20% higher yield than Kufri Pukhraj and has wider adaptability in plains of **stonionalInved** both under rainfed and irrigated conditions highly resistant to late blight, moderately resistant to early blight and leaf spot diseases and tolerant to *Sclerotium* wilt. Tubers suitable both for culinary and processing purpose

### 2. Cashew:

- **NDR-2-1.** Selection performed better in **coastal** region **with an** yield potential of 21 kg per tree, net weight 77-89, stiling percentage of 32 and kernel count of 210 kg.
- **Vengurla-3.** Shown good adoption with early flowering (Dec- Jan) high nut yield (8.75 kg/tree) and better market appearance in northern region.
- Vengurla-5 and Manjeri-5/37 recommended for cultivation at Eastern dry zone of Karnataka

### 3. Daisy flower:

- Variety White Tall Daisy cultivar has given significantly higher number of spikes (10.71/ per plant) as well as higher number of spikes/ha (11.90 lakhs/ha) in Northern Karnataka.

4. Gerebera Varieties viz; Primerose (171.5 flowers/ m<sup>2</sup>), Blessing (154.28 flowers / m<sup>2</sup>) and Chacharelle (161.60 flowers / m<sup>2</sup>) were suitable to get high yield grown under polyhouse condition in Northern Karnataka region.

## CROP PRODUCTION

### (1): Fruits :

1. **Sapota:** Kalipatti and DHS-2 supplied in combination of both organic (10 Kg Vermicompost) and inorganic fertilizers (400:80:300 grams of NPK plants resulted in better growth and yield kg/tree in 13 year old sapota plants.
2. **Jamun:** The *in-situ* soft wood grafting technique in Jamun is successful with 80 percent field establishment.
3. **Potential winter vegetables for salt tolerance**
4. **Pomegranate:** Ethrel 39 % SL (2.5ml/l) spray in the first week of September when soil moisture is low can result in leaf fall and increased yield of pomegranate.
5. **Banana:** 80% evapo-transpiration replacement (ER) at first stage (8-12lit/day), IV stage( (19-25 lit/day) and 70% ER at II stage (13-18 lit/ day) and III stage (19-25lit/day) stage can give higher yield in banana.
6. **Guava:** Dipping guava seeds for 24 hours in cow urine enhanced germination percentage, seedling height and number of leaves with less number of days taken for germination.
7. **Tamarind:** Dipping tamarind seeds for 24 hours in cow urine enhanced germination percentage and seedling height.
8. **Wood apple:** Dipping wood apple seeds for 24 hours in cow urine enhanced germination percent, early germination, seedling height and number of leaves.

### (2): Vegetables:

1. **Knolkhol:** Performed well in **well drained** medium black and red soil and the crop can also be grown in soils having 6-8 ds/m salinity level.
2. **Cabbage** crop is well suited for well drained, fertile sand mixed clayey or red soils. It can be grown in soils having 4-6 ds/m salinity level.
3. **Cauliflower** can be grown in all types of soils. However, well drained medium black and red soil level.
4. **Onion** crop can be grown in all types of soils and well drained sand-mixed clayey soils. It can be grown mixed with sand is well suited. It can also be grown in soils having 4-6 ds/m salinity in soils having salinity level of 4-6 ds/m.

5. **Carrot** can be cultivated in well drained and deep clayey soils. It can also be grown in soil having 4 - 6 ds/m salinity level.
6. **Sweet Potato** can be grown in fertile, well drained, sand mixed clayey soils. It can also be grown in soils having 4 - 6 ds/m salinity level.
7. **Onion:** Effect of bulb size on growth and seed yield of onion cv. Arka Kalyan
  - a. reviewed that bulbs having average weight ranging from 80 to 100g are suitable for planting to get the higher seed yield(800-900kgs/ha).
8. **Coleus:** in coleus row to row spacing of 60cm and plant to plant spacing of 20cm (83,333 cuttings/ha) with 50:50:50 kg/ha of NPK recorded maximum dry tuber yield (18 q/ha)

### (3): Medicinal and Aromatic

1. **Betelvine:** The gallfly resistant strain namely *Erythrina sumembrance* could be raised as standard for betel vine.
2. **Indian lique rice (*Abrus precatorious*):** seed without damaging the embryo enhances germination percentage. Freshly harvested seeds of Indian lique rice (*Abrus precatorious*) have seed coat dormancy. Seeds has to be pinched (nick) manually on the seed coat away from embryo or soaking seeds in GA<sub>3</sub> (100 ppm) for 24 hours will safely remove dormancy and increase the germination per cent (86% germination in Nicking and 80% in GA-3 as compared to 30% in control).
3. **Karonda:** Dipping karonda seeds for 24 hours in cow urine enhanced germination percentage, early germination, seedling height and number of leaves.
4. **Ashwagandha:** Ashwagandha is an important rain fed medicinal crop of our country. It contains different phytochemicals, among which vaithanin and samniferin are important and are used in production of ayurvedic and unani medicines. Roots, bark, leaf, fruit and seeds contain such phytochemicals and used to cure many diseases and disorders.
5. **Performance of medicinal and aromatic plants in coconut garden**  
 Growing of medicinal and aromatic plants like kalmegh (*Andrographis paniculata*), tulsi (*Ocimum sanctum*) and lemon grass (*Cymbopogon flexuosus*)

as intercrops in coconut garden is more remunerative compared to sole crop of coconut. Higher net returns and B : C ratio could be obtained with the intercropping of these crops in coconut gardens of maidan tract of Karnataka.

| Sl. No. | Cropping system       | Yield of coconut (Nuts/ha) | Yield of Intercrop (Kg/ha) | Net Income (Rs./ha) | B:C ratio |
|---------|-----------------------|----------------------------|----------------------------|---------------------|-----------|
| 1       | Coconut + Kalmegh     | 9701                       | 3396                       | 75163               | 2.56      |
| 2       | Coconut + Tulsi       | 9701                       | 4127                       | 77472               | 2.71      |
| 3       | Coconut + Lemon grass | 9701                       | 45788                      | 91561               | 2.89      |
| 4       | Coconut as Sole crop  | 7100                       | -                          | 16610               | 1.88      |

#### 5. Standardization of stage wise requirement of nutrient in Sapota

Application of 100% RDF (400:160: 450 g NPK/ plant) at three stages of growth Viz; June (25% N, 100% P and 25% K), August (50% N 0%P and 50 %K) and October (25%N 0%P and 25%K) for getting high yield (132kg/plant).

#### 6. Standardization of propagation techniques in fruit crops

Maximum success of wedge grafting in Mango, Guava and Sapota was obtained when grafted during September - October months

#### 7. Effect of planting geometry on yield and quality of tomato under shade house

A Spacing of 60x30 cm is recommended for indeterminate tomato grown under 50% shade condition for obtaining higher yield (17.37 kg/m<sup>2</sup>)

#### 8. Nutritional studies in China aster Cv. Kamini

Application of 75% RDF + Vermi compost 2t/ha in china aster Cv. Kamini obtained higher yield (13.87ton/ha) compared to 100% RDF alone (13.56 t/ha)

#### 9. Intercropping studies in cashew

The cashew with Turmeric (Rs.57650), Coleus (Rs.68740) and Ginger (Rs.43655) as intercrops resulted in higher returns

## **10. Studies on fertigation in oil palm through micro irrigation**

The fertilizer dose of 1200:600:1200 g NPK /Plant /year in six equal split doses at bimonthly interval in oil palm gives higher FFB weight (8.74 t/ha).

## **11. Nursery Management in Chilli**

The technology of nipping chilli seedling five days before transplanting of seedling resulted in higher dry chilli yield (966 kg/ha)

## **12. Fertigation of coconut**

Application of 75% NPK through drip was on par with 100% NPK applied through soil application (95.5 nuts/palm)

## **13. Planting method and INM in medicinal coleus**

Planting of coleus in ridges and furrows at 60X20 cm spacing and application of recommended dose of FYM (10t/ha) + 75% of recommended dose of Nitrogen through FYM (7.5 t/ha) and 25% of recommended dose of nitrogen through chemical fertilizers recorded higher yield (23 Q dry tuber yield/ha) .

## **CROP PROTECTION**

### **(1): Insect pests:**

#### **1. Management of Fruit borer in chilli.**

Application of Flubandiamide 20% WDG at 0.5% / is effective in controlling fruit borer in chilli.

#### **2. Management of Cardomom thrips, shoot and capsule borer.**

The application of Methomyl @ 1g/l is more effective than Carbosulfon against thrips, shoot and capsules borers of cardomom.

#### **3. Management of scales in Mango**

Profenofos 50 EC@ 2ml/l + Fish oil Rosin Soap 5% shown significant reduction of mango Scale.

## **(2): Diseases**

### **1. Management of leaf spot disease in Sapota**

Two sprays of carbendazim (0.1%) effectively control the leaf spot disease (5.09%) followed by zineb 0.2% (8.68%). However highest yield was recorded in carbendazim 0.1 % ( 20.13 kg/plant) followed by mancozeb 0.2% (21.47 kg/plant).

### **2. Management of tip over disease in Banana**

Banana Suckers treating with Copper OxyChloride (COC) (4g/l) + streptocycline (0.3g/l) for 45 minutes before planting and basin application of COC (3g/l) + streptocycline (0.3g/l) for every month for 3 times will control Tip over disease.

### **3. Management of damping off chilli**

For control of damping off in chilli, seed treatment with *P. fluorescens* (10g/kg) is effective.

### **4. Management of powdery mildew and fruit rot in chilli:**

Seed Treatment with carbendazim (0.2%) + Seedling dip with *Pseudomonas fluorescens* + 2 Spray of *Pseudomonas fluorescens* at 45 and 60 days + 2 sprays of Hexaconazole 75 and 90 days after planting is effective.

### **5. Management of koleroga and damping off of Arecanut**

As soon as the symptoms of the disease are seen, spraying with 2 g Metalaxyl M Z 72 wp per litre of water to disease affected trees and surrounded trees, followed 1% Bordeaux mixture, after 10-15 days helps to manage the disease.

### **6. Management of Ginger rhizome rot.**

Application of bleaching powder at 2g/lit. + Metalaxyl 1g/lit. + 1g/lit of streptocycline in ginger rhizome before planting can control rhizome rot in ginger.

### **7. Management of early and late blight of tomato**

Management of early and late blight of tomato by using 1 ml of famoxdone + Cymoxanil containing fungicide at an interval of 15 days (3 sprays )

### **8. Inflorescence blight of Arecanut**

Two Sprays of either Difenconazole (0.1%) or hexaconazole(0.1%) during March and April month at 15 days interval is effective to control the disease.

### **(3): Weed management**

#### **1. Weed management in Banana**

The Double crop of cowpea with first sowing along with planting of banana and incorporation in to the soil after 45 days of crop, further after 10 days second crop of cowpea should be sown and incorporated into the soil after 100 days of planting for better management of weeds in banana crop. The yield obtained was 78.65 t/ha with high BC ration of 2.42 (70.86 t/ha yield in control).

### **POST HARVEST TECHNOLOGY**

#### **1. Protocol for processing of green chillies into powder.**

**Methodology:** Cleaned green chillies are blanched in 1 per cent sodium carbonate solution for 5 minutes and immediately cooled by dipping in water. Then, blanched green chillies are minced in a mixer-grinder or mill. Following mincing, green chillies are dried in a tray drier at a temperature of 60°C for 6 to 8 hours. Dried green chillies are then powdered using a mixer-grinder or mill. Green chilli powder thus obtained is packed in aluminum foil pouch or 300 guage polyethylene bag and can be used in various culinary preparations up to 6 months. By blending 4 per cent curry leaf powder or coriander leaf powder, the greenness of green chilli powder can be enhanced.

#### **2. Post- harvest studies in custard apple cv. Balanagar using wax coating.**

Treating the custard apple fruits with wax emulsion -10% recorded 72% marketable fruits as compared to 35% marketable fruits in control after 5 days of storage.



Wax emulsion-10%

Control

#### **3. Preparation and preservation of spice mixture for butter milk.**

**Ingredients** : Green chillies, Garlic, Coriander leaf, Pudina leaf, Cumin, Green ginger, Salt

**Methodology:** Cleaned ingredients are taken as per the proportion as given in the table below. Green chillies (2.5 minutes), pudina leaves (1 minute) and coriander leaves (15 seconds) are blanched in boiling 1 per cent sodium carbonate solution. After blanching, they are immediately cooled by dipping in water. All the ingredients are now ground to paste form in a mixer-grinder or a mill. After addition of salt as per the recipe to this spice mixture, it can be packed and stored in 300 guage polyethylene bags or plastic/glass bottles for a period of 3 months. A tea spoonful of mixture added for a liter of butter-milk makes tasty butter-milk.

| <b>Ingredients</b> | <b>Proportion</b> |
|--------------------|-------------------|
| Green chillies     | 750 grams         |
| Garlic             | 120 grams         |
| Coriander leaf     | 225 grams         |
| Pudina leaves      | 110 grams         |
| Cumin              | 70 grams          |
| Green ginger       | 450 grams         |
| Salt               | 550 grams         |

#### **4. Storage studies in onion**

Storage of onion in bottom and side ventilated storage structure recorded minimum loss (PLW, rotting and sprouting) and maximum percentage of marketable bulbs up to 3 months of storage.

#### **5. Studies on extending the post harvest life of potato by using PVC pipes with different ventilation during storage:**

Storage technology of potato with PVC pipe 5 no+ 5% ventilation significantly recorded less rottage (2.23%) .

#### **6. Nutritional composition, dehydration studies of drumstick leaf products.**

Addition of dried drum stick leaves will supplement of 5-7.5% recorded better sensory acceptability of prepared products (Cutlet, Pakoda, Kichadi and Thalipattu).