Current Trends in Biotechnology and Pharmacy
Vol. 15 (5) 519-523, ISSN 0973-8916 (Print), 2230-7303 (Online)
10.5530/ctbp.2021.3s.49

Survey on crop varieties and agricultural practise of Karnataka

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Abstrac

Pursuing agriculture plays a very important role in the Indian economy. It is the backbone of our country. 70% of the population depends on agriculture for food and money. It is the major profession in the rural areas. The cultivation procedure mainly depends on climatic conditions and nature of soil parameters. Sustainable agronomy uses crops and its varieties that are better adapted to ecologically based production practices than those currently available, which bred for high-input agriculture. This survey exclusively shares the recent times of agricultural practices being used from 90's till date in the 21st Century. We have investigated about 25 different varieties of crops from 7 different regions from the state of Karnataka. The widespread surveys have shown different parameters to ensure the geographical area, flora & fauna and other crop parameters in traditional practice. For instance, in this era more of commercially and ready-to-use practices are followed more than the manual or man-made. There is always a negative side for the positive outcome even in agricultural sectors. Even plants are considered to be humans that live on its shelter and depend on food.

Keywords: Agriculture, flora, fauna

1. Introduction

Every state is known for its unique agricultural produce. Agriculture is one the most important and key for the economy People in Karnataka mostly come from agricultural background and passing on to their generations. Rural part of Karnataka are the main sectors for the farming and that they have good agricultural practices. (Patil, 2009; Mondal, 2011). Though the people of the rural places are not well educated they still have an idea in and around the methods of the farming. They use the traditional method for growing sowing and harvesting of the crops. Agriculture for them is the livelihood, shelter, food and source of living.

The crops in Karnataka mainly grows in 3 different climatic conditions (Ravindrababu *et al*., 2010): Kharif- April-September Rabi- October- December; Summer season- January to March. (Reddy, 1982; Nagarjun and Radder, 1983). There are different types of crops that are growing in Karnataka such as commercial crops, food crops, horticultural crops, floricultural, oilseed crops and plantation crops. It includes corn, coffee, maize, paddy, sugarcane, banana, sunflower, mustard etc. The survey was done in seven different regions of east Karnataka (rural-village). The 7 different regions had different climatic condition, with different growth parameters and the soil in which the crops grow. (Toole et al., 1964), (Venkatesh *et al*., 2016). The survey was done on 25 different varieties of crops for the understanding of their growth, life and the conditions. In some crops the diseases were observed like maize, bitter leaf, mustard etc. (Karthikeyan *et al*., 2009; Abdel-Monaim *et al*., 2011). The survey was done during the day time and the application used here are geo tag and geo earth for the location purposes and to identify the longitude and latitude of the geographical locations.

2. Materials and Methods

The materials used in the survey was questionnaires for the information purposes, a measuring tape and Mobile application for the detection of location: Geo tag & Geo earth. The survey was conducted with the help of the consent of the farmers in their land and the knowledge. The method used in analysing the crops was done using geo tag for the detection of geographical location with longitude and latitude of all the 7 regions of Karnataka.

The regions taken for the survey includes (1) Chikka Gubbi (2) Dodda Gubbi (3) Kalkeri (4) Channasandra (5) Rampura village (6) Hoskote (7) TC Palaya regions of east Karnataka. The crops were identified with the help of the farmers in their local language and common names and expressing it out in the scientific manner.

All the 25 crop varieties of the above 7 regions were taken for the measurement of its height, leaf size, distance between the plants planted, number of leaves in each plant with the number of fruits. Application of pesticides and organic manure was spotted on leaves and type of soil also noted as observation parameters. Virtual observations of different crop fields and the vocal information collected from the agricultural practice of farmers in villages visited enable to understand better about the crops planted, mode of irrigation mechanism with disease management measurement in relevant climatic conditions

3. Results and discussion

Cropping Pattern

Table: 1 Virtually surveyed vegetative parameters of 25 crop varieties in seven different regions of Karnataka

Sl. No.	Field Location	Vernacular Name	Scientific Name	Type of soil	Pesticide	Leaf Size	No. of Leaves	No. of fruits	Plant Height	Distance between plants
1(A)	Rampura Road	Palak	*Spinacia oleracea*	Red	Coragen, Kem-45	3cm	4	----------	10"-1ft	8" inch
2	Rampura Road	Pumpkin, Kaddu	*Cucurbita*	Dry	Mancoze B	9cm	2-3	1/crop	12cm	4" ft
3	Rampura Road	Guva, Peru	*Psidium guajava*	Red	Karaban-50	5.6cm	5-6	2-3	15ft	8" ft
4	Rampura Road	Orange, Santra	*Citrus sinensis*	Red	Chlorpyrifos	3.5cm	8/branch	1/leaf	20ft	4-6" ft
5	Rampura Road	Fig, Anjeer	*Ficus carica*	Dry Red	Sulfur Spray	5cm	5/branch	No season	20-25ft	5" ft
6	Rampura Road	Banana, Kela, Pazham	*Musa balbisiana*	Dry Red	Chlorpyrifos Carbyl	44cm	1	4-6/branch	15-20ft	60cm
7	Rampura Road	Carambola	*Averrhoa carambola*	Dry Red	Oraganocide Graden Spray	3.2cm	20/branch	2/leaf	20-25ft	10 ft
8	Rampura Road	Coffee	*Coffea arabica*	Dry Red	Cypermetrin Deltametrin	7cm	20/branch	5-6	20-24ft	4" ft
9	Rampura Road	Rose Apple	*Syzygium aqueum*	Dry Red	Neem oil, Insecticidal Soap	6.5cm	10	5/branch	25-30ft	6" ft
10(B)	Hoskote	Bitter Gourd	*Momordica charantia*	Red	Permethrin Deltametrin	2cm	20	5-6/branch	70cm	22cm
11	Hoskote	Chilli	*Capsicum frutesens*	Red	Combination of crushed garlic and chilli powder with one tablespoon of vegetable oil + soap liquid	1.5cm	6-7	15-20/branch	20cm	2cm
12	Hoskote	Papaya	*Carica papaya*	Dry Red	Combination of Immuno +Enviro+ Cyto Plus.	5.2cm	20-30	20/plant	12ft	5" FT
13	Hoskote	Chikku	*Manilkara zapota*	Red	Profenophos Cypermetrin	4cm	8	6/branch	15-20ft	4" FT
14	Channasandra	Malabar Nuts	*Justicia adhatoda*	Black	No Spray	4cm	6-10	------	12ft	2ft
15	Channasandra	Lemon	*Citrus medica*	Red	Neem oil, Insecticidal Soap	3.5cm	5-6	1/leaf	2ft	2ft
16	Channasandra	Grape	*Vitis sp.*	Red	Carbyl, permethrin Spinosad	5cm	10	Bunch	60cm	2ft
17(D)	Kalkeri	Gotukula	*Bacopa monnieri*	Dry Red	Permethrin Deltametrin	1.5 cm	10	--------	0.5ft	30 cm
18(E)	Chikka Gubbi	Marigold	*Chrysanthemum morifolium*	Dry Red	Pyrethroids	2 cm	6-8	-------	1ft	18 cm
19	Chikka Gubbi	Corn	*Zea mays*	Dry Red	Atrazin Glyphospahte Mixture	33 cm	3-4	2-3	60cm	21cm
20	Chikka Gubbi	Musturd	*Brassica nigra*	Dry Red	Organic Sucking pest Controller Liquid	1 cm	10-15	-----	5.8ft	5cm
21	Chikka Gubbi	Copper Leaf	*Acalypha wilkesiana*	Dry Red	Copper Fungicide	3 cm	12-15	------	2m	2 ft
22 (F)	Dodda Gubbi	Monkey Grass	*Ophiopogon japonicus*	Dry Red	Neem oil	15 cm	20	-------	1m	20cm
23	Dodda Gubbi	Sarpagandha	*Rauwolfia serpentina*	Dry Red	Neem, Pyrethrin	2 cm	10	2/branch	2ft	2ft
24 (G)	T.C Palaya	Garden Croton	*Codiaeum variegatum*	Dry Red	Neem oil	15 cm	5-7	10	2m	1ft
25	T.C Palaya	Bitter Leaf	*Veronica amygdalina*	Dry Red	Neem, Pyrethrin	30 cm	7-8	1/branch	4ft	1m

The above table shows that the most used soil is Dry red soil or red soil in which the crops are growing and this soil is favourable in all the climatic conditions and giving proper nutrients and nourishments to the plants. The pesticides are occasionally used for the plants because the crops grown in all the above 7 regions are protected from unwanted pests and weeds and therefore the crops are grown at the best without the use of much pesticides.

Table: 2 Climatic conditions and agricultural practices of 25 crop varieties in seven different regions of Karnataka

SL.No.	Vernacular Name	Season	Weather	Manure Used	Irrigation method
1	Palak	Spring, late winter, late summer	Cold weather, shady climate	Cow dung	Drip
2	Pumpkin, Kaddu	December- January (or) June – July	Warm climate	Cow dung	Drip
3	Guva, Peru	July-September	Cold climate	Cow dung	Drip
4	Orange, Santra	July to September	Moderate	Cow dung	Drip
5	Fig, Anjeer	Summer season (February – March)	Hot climate	Cow dung	Drip
6	Banana, Kela-Pazham	Any season	Humid and dry	Waste vegetables, cow dung	Drip
7	Carambola	September-October January-February	Warm, moist climate	Organic waste	Drip
8	Coffee	November to January	Hot and humid climate	Cow dung	Drip
9	Rose Apple	June to September	Cool climate	Cow dung	Drip
10	Bitter Gourd	January to March, June-July	hot and humid climates.	Waste materials from kitchen & cow dung	Sprinkler
11	Chilli	January-February; September-October	Moderate	Waste materials from kitchen & cow dung	Sprinkler
12	Papaya	Throughout the year	Very hot climate	Waste materials from kitchen & cow dung	Sprinkler
13	Chikku	Throughout the year	Moderate climate	Waste materials from kitchen & cow dung	Sprinkler
14	Malabar Nuts	June-July	Hot climate	Goat pellets and cow dung	Sprinkler
15	Lemon	December- March	Moderate	Goat pellets and cow dung	Sprinkler
16	Grape	April to September, October to March	Hot & dry period	Organic waste, Goat pellets and cow dung	Drip
17	Gotukula	November- January	Humid & warm	Cow dung	Drip
18	Marigold	November- January	Moderate	Goat pellets and cow dung	Sprinkler & drip
19	Corn	April- May	Warm and sunny	Cow dung, Waste vegetables	Sprinkler & drip
20	Musturd	September-October, February-March.	Cool & dry climate	Cow dung, Waste vegetables	Sprinkler & drip
21	Copper Leaf	November- January	Cool and sunny season	Cow dung, Waste vegetables	Sprinkler & drip
22	Monkey Grass	June- August	Cool climate	Cow dung, Waste vegetables	Sprinkler & drip
23	Sarpagandha	October- January	Cool climate	Cow dung, Waste vegetables	Sprinkler & drip
24	Garden Croton	Throughout the season	Moderate climate	Cow dung, Waste vegetables	Sprinkler & drip
25	Bitter Leaf	April- May, June- July	Hot climate	Cow dung, Waste vegetables	Sprinkler & drip

The above crop varieties grow in different season in their favourable climate. The use of manure here are the cow dungs and waste vegetables which has been practiced since ages for the agricultural practices. Cow dung has lot of potentials for the growth of the crops. Irrigation method used in all the crops are combination of drip and sprinkler irrigation methods that helps and support the plants.

Table: 3 Insects and plant disease observed in field crops

S.No.	Plant Name	Insects in Particular Plants	Plant disease
1	Palak	Cutworm, Aphid	Downy, mildew, Fusarium will
2	Pumpkin, Kaddu	Beetles	Powdery mildew
3	Guva, Peru	Fruit fly, mealybugs	Guava wilt, fruit rot
4	Orange, Santra	Leaf miner, whitefly	Citrus canker
5	Fig, Anjeer	wasp	Fig mosaic virus, brown rot
6	Banana, Kela, Pazham	Mealybugs, red spider, aphids	banana wilt
7	Carambola	Mites, caterpillar	Anthracnose, sooty mould

8	Coffee	Mealybugs	Coffee rot, *Hemileia vastatrix*
9	Rose Apple	Aphids, Scales	Not Known
10	Bitter Gourd	Melon fruit fly	Bitter gourd yellow mosaic virus
11	Chilli	Aphids, whitefly	Mosaic leaf, powdery mildew
12	Papaya	Aphids, whitefly	Papaya mosaic disease
13	Chikku	Caterpiller	Leaf spot, sooty mould
14	Malabar Nuts	-	*Rhizoctonia solani*
15	Lemon	Citrus butterfly, whitefly	lemon scab, brown rot
16	Grape	Berry moth	Botrytis, downy mildew
17	Gotukula	Red spider mites	Not Known
18	Marigold	Aphids	Smuts
19	Corn	Corn earworms	Eye spot, southern rust
20	Musturd	Aphids	Damping-off,
21	Copper Leaf	Mealybugs	Not Known
22	Monkey Grass	Beetles	Not Known
23	Sarpagandha	Scale, citrus black fly	Leaf spot disease
24	Garden Croton	Mealybugs, Scales	Powdery Mildew, Crown Gall
25	Bitter Leaf	Mealybugs, Scales	Not Known

The plant diseases and insects vary from crops to crops. Each insect plays a role in their particular plant habitat**.** The plant diseases caused due to many parameters like the spotting of the whole plants or any part of the plants, it can also happen to the disease-causing insects/ birds/animals/pesticides etc. There are few crops whose diseases are not known or studied till date such as Garden croton, monkey grass, bitter leaf etc.

Fig: 1 Field view of chrysanthemum – Chikka Gubbi, Karnataka

Fig: 2 Red Soil field – Channasandra, Karnataka

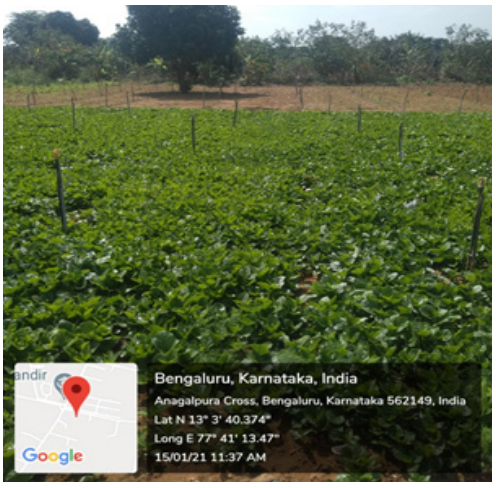

Fig: 3 Palak field – Ramapura, Karnataka

- The cropping pattern of the region is influenced not only by agro-climatic conditions like rainfall, soil, temperature, but also by government policies and programmes for crop production in the form of subsidies, support prices, tariffs and speed of infrastructure development.
- The overall trends in area allotted for various crops during five decades show that cropping pattern in Karnataka is dominated by food crops, with a share of more than 60 per cent of the gross cropped area in the state. Rice, sorghum and finger millet were the major cereals till 2000-03.
- As expected, mixed or inter-cropping is practiced more in the northern and central regions than in the southern region. Rice-rice rotations are common in irrigated areas of southern as well as coastal and hill regions. Sugarcane is grown in sizable areas in all the regions using canal irrigation. Coconut, Malabar nut, grapes, sapota, citrus, etc. are the important fruit crops grown in the state.

The study was conducted in the duration period of 10 -15 days in these 7 regions with 25 crops under different soil condition and climatic conditions. The height of the plants and the leaf size was calculated statistically by taking the mean and average of the plants. The soil used was mostly red dry soil and black soil for the growth and better health. The irrigation method used was 90% of drip irrigation with minimal force and widespread of water while other 10% of the crops used sprinkler method.

Use of commercial pests and manure was less compared to the urban region of Karnataka's agricultural lands as in the above-mentioned regions used only cow dung, goat pellets, vegetable waste and organic wastes from their houses. Pesticides, fungicides and bactericides was not used much because 98%, the crops were grown in a better care-taken protection and pest free with no much plant destruction. The crops grown are healthier than the plants grown with commercial ones. These 25 crops show better result of growth, under their favourable conditions. These areas pollution free areas which makes the crops grow healthy and better production for the consumers. The air present in these locations is clear and allows the crops to breathe and live properly.

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