

CULTIVATION OF WATERMELON – AN EFFECTIVE WAY FOR UTILIZATION OF BARREN LAND IN PATHANAMTHITTA DISTRICT OF KERALA

Introduction

The major problem faced by Kerala State is conversion of paddy fields to other enterprises and drastic decrease in paddy areas, which had made many agricultural labourers especially the women, jobless. Moreover leveling of flood channels in paddy fields started inducing flood problems in different parts of the State, which aggravated ground water depletion during summer. The combined effect of environmental and farm degradation, mono-cropping, less usage of organic components in farming, have led to reduction of agriculture production in the State as a whole and it had become high time for the extension agencies to take up alternative cultivation approaches.

Watermelon is cultivated in different parts of India. In South India, its cultivation is mainly restricted to Karnataka and Tamil Nadu. In Kerala, different field trials at KVK farm indicated that the crop flowers as well as fruits in the prevailing agro-climatic conditions of Pathanamthitta. Realizing that cultivation of this crop could be a profitable enterprise during summer season in the paddy fallows, the KVK took up the venture of transferring this innovation among farmers. As this crop was an introduction to Pathanamthitta, multi-methodology approach was adopted to ensure full-fledged cultivation. The step-wise progress from 1998-99 to 2003-04 had been systematically detailed in the timeline of events.

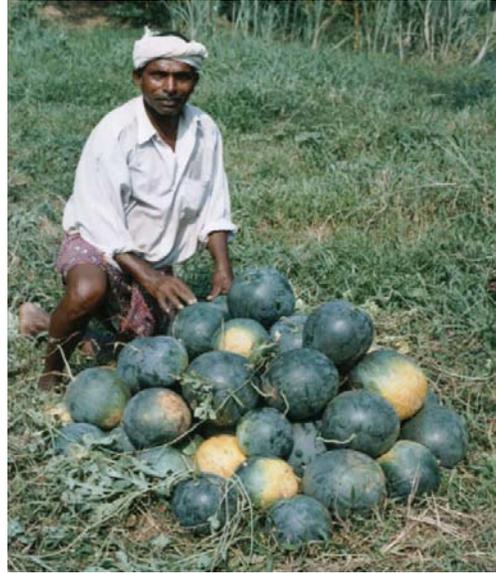


Fig.1 Harvested Watermelon at farmer's field

As the timeline indicates, the KVK started its intervention with a pilot study among 120 trainees-cum-vegetable farmers of Pathanamthitta district to understand the degree of innovativeness among vegetable growers. The objective was to identify the farmer group among whom this crop could be introduced and perpetuated successfully.

Time line of Watermelon Cultivation in Pathanamthitta District

1998-99

- ❖ KAU research reports revealed that watermelon comes up well under central and south Kerala conditions.
- ❖ Field trials at KVK instructional farm confirmed that the crop fruits and flowers in the prevailing agro climatic conditions of Pathanamthitta District.
- ❖ No Adoption.

1999-00

- ❖ Survey was conducted among the 120 vegetable trainees to identify innovator category of farmers and 20% were categorized as innovators.
- ❖ On-farm testing (OFT) was taken up in these innovators field, which failed due to large scale cracking of fruits.

2000-01

- ❖ Trainings were imparted to 128 farmers.
- ❖ OFT was conducted with modified fertilizer recommendation in the same farmers' field.
- ❖ Average yield – 11 tons/acre.

2001-02

- ❖ Location specific package developed with participation of farmers.
- ❖ Frontline Demonstration on introduction of watermelon in farmers' field was undertaken in 10 farmers' fields.
- ❖ Training was imparted to 165 watermelon growing farmers in six batches.
- ❖ Average yield -13.6 tons/acre.

2002-03

- ❖ Training imparted to 780 beneficiaries. In addition, trainees of the KVK in turn trained large number of fellow farmers resulting in farmer to farmer spread.
- ❖ 51 master farmers were trained during crop demonstration for further spread of the technology.
- ❖ Cultivation was taken up by six men groups (Haritha Sangams) and seven women groups (Kudumbasree) in an area of 12.35 acre.
- ❖ Vermicompost production started increasing, but inadequate quantity and higher cost per unit was felt by many farmers.
- ❖ OFT was initiated to study the efficiency of coir pith compost as an alternative to vermicompost.
- ❖ Undertook a project on large-scale production of coir pith compost with Central Coir Research Institute along the coastal areas of Kollam and Alleppey districts where tons of coir pith is accumulated.
- ❖ Acreage under cultivation increased up to 17.58 acre.
- ❖ Average yield -16.9 tons/acre.

2003-04

- ❖ Training imparted to 1042 farmers directly from KVK as well as in collaboration with Department of Agriculture and Panchayats.
- ❖ Boost up of coir pith compost production and products were sold in the brand name "Shree Shakti"
- ❖ Acreage under cultivation increased up to 188.95 acre.
- ❖ Average yield -16.23 tons/acre.

Seasonality of the Crop

Watermelon is cultivated from December to April. This is the vegetable-growing season of Kerala State, as a result of which fall in price of different vegetables like pumpkin and cucumber happens due to market glut. KVK intervened at this juncture and recommended watermelon cultivation, watermelon was adopted in paddy fallows from December to April as denoted in Fig. 2.

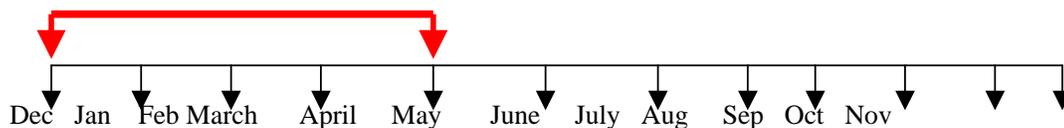


Fig. 2. Seasonality of Watermelon

Frontline Demonstrations

Front Line Demonstrations of the location specific package of practice developed during 2001-02 was carried out in the selected 10 farmer's fields under the guidance of KVK. The critical inputs were provided by the KVK. Each farmer planted 5 to 12 pits at the rate of 3 plants per pit. The sowing was done by December end. Flowering started 90 days after sowing. It took another 30-40 days for maturation. There were 5 to 10 fruits per plant and average fruit weight was 5Kg. There was no pest and disease incidence throughout the cultivation. Due to hairy nature of the fruit at initial growth stages infestation of fruit fly was nil. About six tons of watermelon was produced from 0.45 acre and sold at Rs. 6/ Kg (Table 1).

Table 1. Yield of Watermelon in FLD plots

Sl.No.	Name of the farmer	No of pits	Yield (Kg)
1.	Krishnankutty	6	525
2.	Cherian Abraham	5	420
3.	C.N. Chandran	10	820
4.	Babu Varghese	8	700
5.	Thankappan Pillai	5	400
6.	Unnikrishnan Nair	12	970
7.	Ravindran Pillai	5	380
8.	Omanakuttan Pillai	8	675
9.	Rajan Varghese	10	785
10	K. P Samuel	5	410
Total		74	6085

The yield obtained by the farmers had created a landmark in the history of agriculture in Pathanamthitta district. Average yield/plant was about 30 kg and average yield/acre was nearly 20 tons. It was observed that the advantages of this technology had to be elicited in detail in collaboration with the experimental farmers so that the farmers themselves could explain the advantages of watermelon cultivation. The cost of cultivation, income statement and other aspects of watermelon worked out for FLD plots are given in Table 2.

Table 2. Results of Frontline demonstrations

Particular	Quantity
Average fruits per plant (No.)	6
Average weight of each fruit (Kg)	5
Average yield per plant (Kg)	30
Plant population per acre (No.)	666
Average yield per acre (Kg)	20,000
Market price (Rs/kg)	5
Gross income (Rs/acre)	1,00,000
Total cost of cultivation (Rs/acre)	55,564
Benefit Cost Ratio	1.80:1

It could be inferred from the above that watermelon cultivation is profitable to farmers in Pathanamthitta district. Based on this a field day was conducted in the most successful farmer's plot. Wide publicity was given for the event through newspapers, radio and T.V.

Interventions of the KVK

An innovative empowerment approach developed by a Nepal based NGO titled "Appreciative Planning and Action" (APA) was applied with few modifications for empowerment mobilization with effective women's development. The APA had six stages and each stage had distinctly different activities indicated by 6 D's and the extent of participation of the members in these stages is depicted in Table 3.



h women

The 6 D's of Appreciative Planning and Action

- **Discovery:** This step encourages thinking about their past successes, understand and appreciate them. Recalling their successes filled them with energy and joy.
- **Dream:** Farmers drew their colourful dreams and enjoyed them. These dreams were built directly on their own accomplishments.
- **Design:** Farmers were encouraged to plan what they must do to turn their dream into reality.
- **Delivery:** Members committed to do at least one thing to achieve their plans.
- **Do it now:** They try to get started by making a detailed plan or drafting a needed letter. This was just to give a push towards their plan.
- **Discuss/ dialogue:** Before the end of the session, they were made to realize achievements of the day.

Table 3. Participation of members of SHGs in different stages of APA

Stages	Number	Percentage
Discovery	36	60
Dream	38	63
Design	42	70
Delivery	45	75
Do it now	46	77
Discuss/dialogue	48	80

It is evident that members' participation had improved from 60% to 80% as they moved from one Phase of the programme to the next.

Farmers as Trainers

KVK postulated that if farmers could master the process of "discovery learning" in their own fields, they could also facilitate other farmers in their learning. Based on this idea these innovative farmers were developed as master trainers for further promotion of technology. Impact of this attempt was evident on the occasion of field day as these farmers themselves explained the pros and cons of watermelon cultivation technology to their fellow farmers. As a result, farmers who had initially declined to take up watermelon, volunteered to grow the crop from the very next season. Further trainings were arranged through Department of Agriculture in which master trainers imparted trainings along with the assistance of KVK officials. Trainings conducted by using master farmers were very successful as the adoption of the technology was significantly higher.

Group Approach in Watermelon Cultivation

Based on the success, number of groups established through Department of Agriculture and Self Help Groups established through Panchayats came forward to take up the watermelon cultivation in the district. As could be seen from Tables 4 to 7, the area under watermelon cultivation by different men and women groups during 2002-03 and 2003-04 had increased.

Productivity of watermelon, cultivated by the men groups, increased from 18.4 tons/acre in 2002-03 (Table 4) to 24.15 tons/acre in 2003-04 (Table 5). However, yield of watermelon cultivated by the women groups was 17.08 tons/acre in 2002-03 (Table 6) and 15.72 tons/acre in 2003-04 (Table 7).



Fig 3. Women group members during the field visits

Table 4. Achievements of men groups in terms of yield and net income for the year 2002-2003

Sl.No	Village	No. of farmers	Area (acre)	Av. yield (kg/acre)	Net income (Rs/acre)
1	Puramattom	12	1.25	22,000	1,10,000
2	Ayroor	13	0.40	19,000	95,000
3	Mannar	10	0.25	17,500	87,500
4	Chittar	14	1.00	21,200	1,06,000
5	Mallapally	12	0.30	11,000	55,000
6	Eraviperoor	13	1.00	13,500	67,500
Total / average		74	4.20	17,367	86,833

Table 5. Achievements of men groups in terms of yield and net income for the year 2003-2004

Sl.No	Village	No. of farmers	Area (acre)	Av. yield (kg/acre)	Net income (Rs/acre)
1	Puramattom	16	1.30	22,000	110,000
	Puramattom	14	1.00	21,200	106,000
2	Ayroor	14	0.60	16,750	83,750
3	Edapavoor	12	1.05	23,000	115,000
4	Mannar	11	0.75	17,500	87,500
5	Chittar	14	2.00	20,000	100,000
6	Eraviperoor	13	1.00	19,400	97,000
7	Mallapally	12	0.50	16,000	80,000
8	Kodumon	15	1.75	48,700	243,500
9	Pandalam	12	1.00	21,000	105,000
10	Pullad	13	2.00	21,000	105,000
Total / average		146	12.95	22,413	1,20,753

Table 6. Achievements of women groups in terms of yield and net income for the year 2002-03

Sl. No	Name of the village	No. of farmwomen	Area (acre)	Av. yield (Kg/acre)	Net income (Rs/acre)
1	Aranmula	48	1.05	23,000	115,000
2	Kulanada	14	0.75	17,300	86,500
3	Ayroor	32	1.25	11,000	55,000
4	Kozhencherry	40	0.10	18,200	91,000
5	Kodummon	23	2.00	17,000	85,000
6	Kadapara	21	1.00	16,500	82,500
7	Pandalam	65	2.00	18,000	90,000
Total / average		243	8.15	17,080	85,396

Table 7. Achievements of women groups in terms of yield and net income for the year 2003-04

Sl.No	Name of the village	No. of farmwomen	Area (acre)	Av. yield (Kg/acre)	Net income (Rs/acre)
1	Ezhamkulam	38	4	17,500	87,500
2	Kodumon	42	5	18,000	90,000
3	Aranmula	126	13	15,000	75,000
4	Puramattom	76	8	16,200	81,000
5	Naranganam	52	4	17,750	88,750
6	Konni	36	4	17,000	85,000
7	Omallyoor	26	3	18,000	90,000
8	Kulanada	12	1	14,400	72,000
9	Vadasserikkara	33	4	15,500	77,500
10	Pallickal	158	16	13,700	68,500
11	Pramadom	125	12	14,500	72,500
12	Eanath	25	3	15,500	77,500
13	Pandalam	157	6	16,000	80,000
14	R-Pazhavzngadi	28	3	14,750	73,750
15	Ayiroor	147	14	15,000	75,000
16	Kadapara	58	6	16,000	80,000
17	Chennerkara	25	3	17,750	88,750
18	Vallicode	18	2	17,700	88,500
19	Mallappuzhadsey	92	8	15,000	75,000
20	Kalanjoor	65	7	19,000	95,000
Total / average		1339	126	15,727	78,636

As per the cost of cultivation of watermelon, the major input cost was for labour, fertilizer and seeds. To reduce the cost most of the growers had started vermicompost units of their own. Another positive factor of this cultivation is the utilization of family labour. Interest in watermelon crop was extremely high among women groups as evident by the sudden spurt in their involvement (Fig. 5).

Women are keen learners

Active women groups were selected further for generating location specific technologies as women showed eagerness to experiment. It was also observed that once they were convinced of the benefits of the technology they had become dynamic disseminators. For getting good participation and encouraging intra and inter group activity, KVK organized a group meeting and discussion sessions.

Selecting technology to local situations

Based on the PRA among the watermelon cultivators, an OFT on “Efficiency and feasibility of different organic manures (vermi compost, neem cake and coir pith compost) in watermelon cultivation” was implemented with the following treatments.

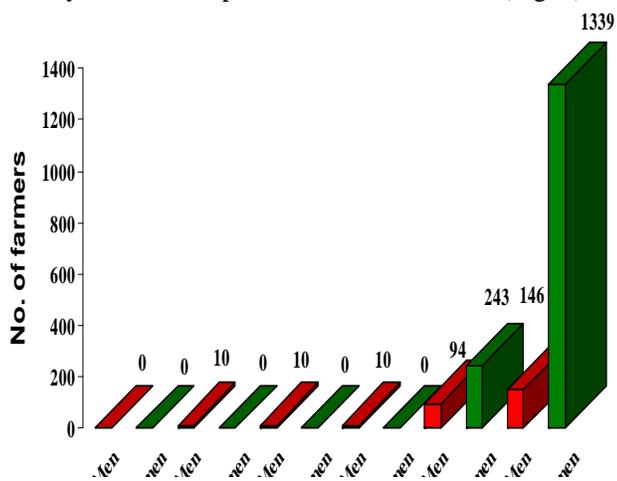


Fig. 4. Increased involvement of farmwomen in watermelon cultivation

Treatment I

- a) Application of 4 Kg coir pith compost + 500 g neem cake as basal dose/pit
- b) Application of 3 Kg coir pith compost/ pit as first top dressing
- c) Application of 3 Kg coir pith compost/pit as second top dressing

Treatment II

- a) Application of 4 Kg vermi compost + 500 g neem cake as basal dose/pit
- b) Application of 3 Kg vermi compost/ pit as first top dressing
- c) Application of 3 Kg vermi compost/pit as second top dressing

Growth and yield of the crop supplied with vermicompost was higher as compared to the crop supplied with coir pith compost (Table 8). However, in plots where coir pith compost was applied, soil water retention was high and as a result the number of irrigation was reduced. Flower drop was also reduced to a greater extent due to the presence of sufficient moisture in the soil. The reduced cost of production resulted in a higher B: C Ratio (2.78:1) for coir pith compost applied plots.

Table 8 Results of the on-farm testing

Sl. No.	Particular	Coir pith-based nutrient management	Vermi-compost based nutrient management
1	Yield (Kg/acre)	17325	18060
2	Gross income (Rs/acre)	103950	108360
3	Total cost of cultivation (Rs/acre)	37392	43870
4	B: C Ratio	2.78:1	2.47:1

Based upon the OFT results, coir pith compost was recommended to farmers along with vermicompost. The watermelon cultivators used coir pith compost in large quantities in 2003-04.

Spread of watermelon cultivation

The year 2003-04 could see a sudden increase in the area under watermelon due to direct and indirect effects. Apart from the direct influence of the KVK activities like trainings, demonstrations and visits, the farmer-to-farmer and extension functionaries to farmers contributed to the widespread cultivation of watermelon. The spread effect was to an extent of 1: 2.7: 7.0 in two years time from 2001-02 to 2003-04. (Fig 7)

Indirect Impact of the Technology: Promotion of Coir Pith Composting

Based on the increased demand, a collaborative project was undertaken by the KVK and Coir Board in which 10 SHGs from the coastal areas were trained on coir pith composting. It was expected that coir pith compost making will increase the employment opportunities, generate income, encourage organic farming and will reduce environmental problems. The KVK as well as Central Coir Research Institute (CCRI) officials conducted need-based training and demonstrations for SHGs in different Panchayats in the areas famous for coir industry. After the training programme, SHGs took up the initiative for composting coir pith in collaboration with KVK and CCRI.

Under the project *Pleurotus* fungus and urea was provided to the women groups free of cost from CCRI for converting about 500 tons of pith into compost. With a formal inauguration, this manure was introduced into market. These SHGs sold their product in the brand name 'Sthreesakthi'. The Certificate, indicating the different nutrient contents of the manure, issued by CCRI was an added advantage for these women groups. Thus, these women developed the compost by utilizing their own labour and supplied them in large quantities to watermelon beneficiaries @ 3.50 Rs/Kg, which had led to an indirect boost up of compost production in the region. They have become regular suppliers of this low cost manure among the vegetable farmers, which is profitable venture to both groups.

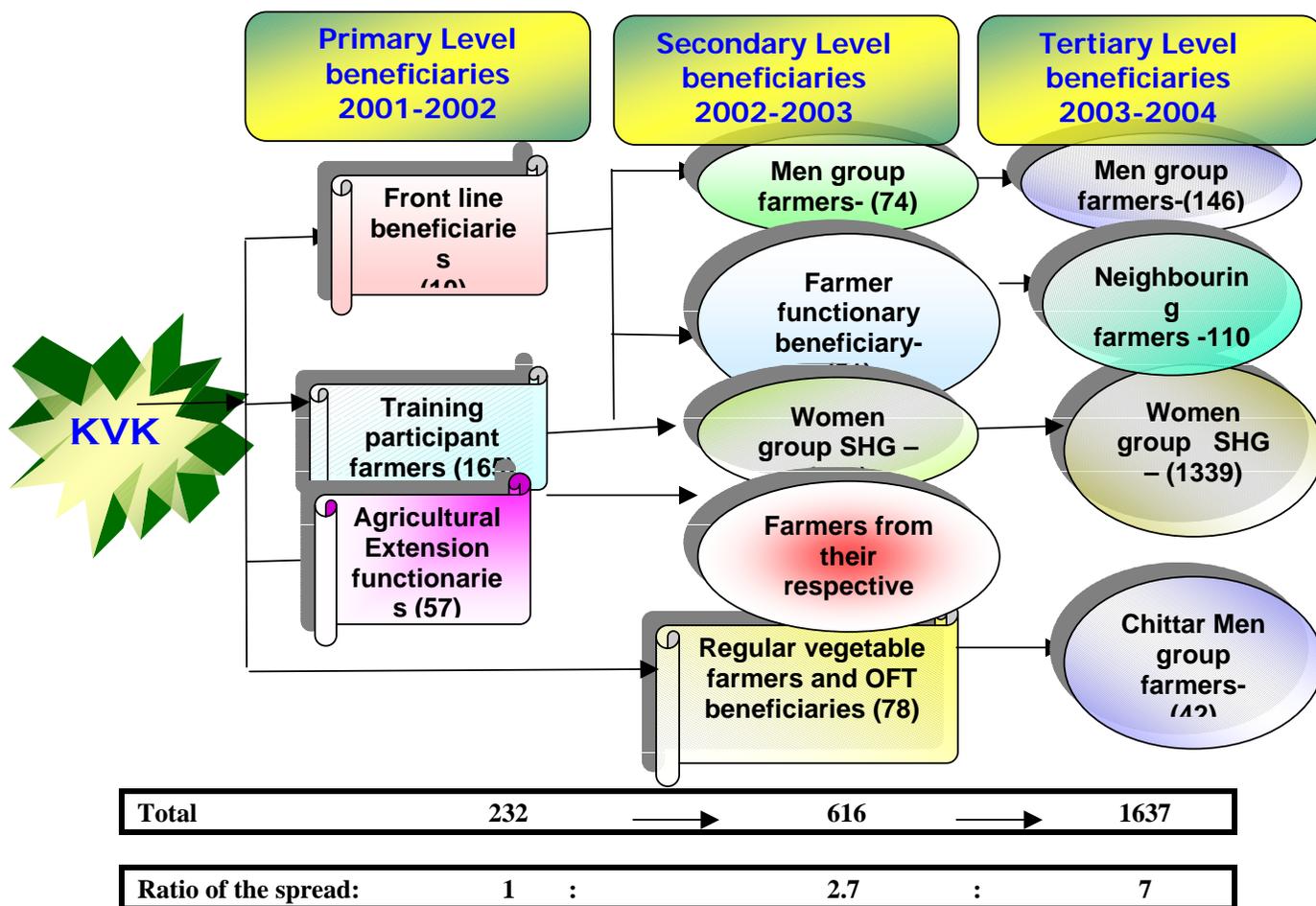


Fig. 5. Schematic representation for spread of the technology among different beneficiary groups

Linkages Developed

KVK had acted as both a promoter and intermediary agency in the promotion of watermelon cultivation. Different organizations involved and the nature of support provided by them are described in Table 9.

Table 9. Potential Partners’ Matrix Developed by Watermelon cultivators

Organization	Strengths	Nature of linkage
KVK Pathanamthitta	Qualified technical experts in almost all areas. Good instructional farm in which different crop varieties are tested and demonstrated	Quality seed and planting materials at low cost. Trainings and technical guidance on farmers field problems
Dept of Agriculture Kudumbasree programme (Panchayats)	Qualified and motivated extension agents. More funds to support large scale projects Enthusiastic staff with good rapport building capacity upto grass root level.	Seed and planting material free of cost and subsidy, wherever available Provide proper support to consolidate and create good market avenues
NGOs	Effective in mobilizing women groups Dedicated trained resource persons developed from the community itself to work with farmers and farm women	Could promote greater dynamism among groups using master trainees. Improve relationship of officials with local people

Organization	Strengths	Nature of linkage
Panchayats	Patronage and support for new enterprises	Better funding opportunities for peoples plan
Banks	Finance for supporting agricultural industry with low interest	Extend support for small scale industries
Kerala Agricultural University	Innovations and qualified technical personnel	Transfer of these innovations to farmers

Large-scale cultivation of watermelon through Farmer Functionary Research (FFR)

Master trainers and KVK staff trained the watermelon farmers under Farmer Functionary Research (FFR) programme. These farmers conducted the OFT in their field by themselves with support from KVK. They compared the new practices with existing technology and came to conclusion that watermelon could be beneficially cultivated in the present agro climatic conditions. Moreover, no pest and disease incidence was reported, which had reduced the input cost.

Farmers' innovations

Managing water logged situation with vine twisting: The recommended practice is withholding of irrigation 15 days before harvesting for increasing sweetness and avoid fruit cracking. Under Kerala conditions, unexpected summer rain during harvesting time causes cracking and reduces sweetness. Farmers from their field experience found out that twisting of the stock of watermelon reduces the passage of water into the fruit.

Scientific rationale: This may reduce the translocation of water through vascular bundles.

Extension through interactive CDs: A Step towards Cyber Extension

Interactive Compact Discs (CD) on watermelon cultivation was prepared by CARD-KVK in Malayalam language. This CD was prepared from the fields of the successful farmers depicting their field situations, which is now the source of first hand and real time information. This is being used as farmer-to-farmer information-sharing channel, which had become the most effective channel for easy and rapid transfer of any technology. Major advantage of the CD is that it could be used to simulate on-farm situations during off-season. Information regarding the queries based on the cultivation is now being provided through internet along KVK website (www.kvkcard.org).

Training through interactive CD had brought in good impact as compared to traditional methods. Based on the success of this innovative venture a digital library was sanctioned to the KVK from the Panchayat. Almost all equipments required for the preparation of CD's on different crops were supplied and a phone as well as internet connection had been provided to upload information through net.

Summary

The multi-faced, decentralized, agro system-specific extension approach, which is blended with farmers' indigenous knowledge and experimentation, had been very successful in introducing a crop hitherto unknown to Kerala situation. The KVK had acted in accordance with the demand of the condition. Through technical, material and collaboration support, thereby ensuring successful introduction of watermelon crop in the district.

[BACK](#)