

BEST PRACTICE-I

1. Title of the Practice: The Hydroponics – Soil less culture of plants

2. The context that required the initiation of the practice.

In the present day context of environmental pollution the quality of leafy vegetables and vegetables is deteriorating. The production of these plants is linked with the heavy usage of chemical fertilizers and pesticides. The usage of these chemicals is very harmful to the soil as well as the produce. So to weed out the unwanted chemicals hydroponics is the best solution. Through hydroponics we can minimize the fertilizer consumption and no pesticides are used. The mineral nutrition of each plant varies so we give only those nutrients that are required for the metabolism of the plant. There is no excess wastage of nutrients. It is also a novel method of growing plants where the students can better understand and assimilate the knowledge regarding the mineral requirement of plant, P^H requirement etc. In some crops it is known that the produce is high through this method when compared to the traditional cultivation in the soil.

3. Objectives of the practice

- To acquaint students with novel method of cultivation without soil.**
- Environmental friendly cultivation of leafy vegetables.**
- Quality product production with no traces of heavy metals.**
- Production of leafy vegetables with minimum usage of water.**
- Production of leafy vegetables and wheat grass by using Deep water culture and NFT (Nutrient film technology)**
- Production of some vegetables like Tomato and Capsicum through Dutch bucket model.**
- Primary objective is to make the student understand alternative method of growing plants in their home itself with minimum cost minimum nutrients.**

4. The Practice

In our college we planned to develop three different types of Hydroponics units namely, Deep Water Culture, Nutrient Film Technology (NFT) and Dutch bucket model. The first two units are used to grow the shallow rooted plants like leafy vegetables (Coriander, Methi, Lettuce and Amaranthus etc.) where as the third unit is used to grow the deep rooted plants like tomato, Brinjal and Capsicum etc.

Interesting point to note is that all the hydroponic units are designed and prepared by our Botany faculty and the students with the help of the labour. Intense search is done and knowledge is gathered by the Botany faculty to design the hydroponic units which costs almost one fourth of the commercial hydroponic units sold by the hydroponic giants like Brio hydroponics, Ahmedabad, Gujarat and Urban Kisan Hydroponics, Hyderabad, Telangana state.

In preparing NFT (Nutrient film Technology) unit normal PVC pipes are used instead of food grade plastic pipes like UPVC and CPVC. This step reduced the cost of the NFT unit to the maximum level. As we started the Hydroponics as a trial basis, the primary goal is to master the art of Hydroponic culture. Once it is achieved new hydroponic food grade plastic NFT models can be developed.

Two "A" type wooden stands are prepared and eight PVC pipes are fitted on these stands. All the pipes are interconnected and reservoir with Motor is fitted to circulate the nutrient solution. Through this NFT hydroponic unit we raised the leafy vegetable like Amaranthus on the trial basis and we achieved in producing the plant. Now our plan is to develop other leafy vegetables like Spinach (native) and Lettuce (exotic variety) in our Hydroponics lab.

In preparing the Deep Water Culture units we procured the plastic tubs (10) with a capacity of 10 litres. Railway decolum is used to cover the plastic tubs. On the Railway decolum holes are made as per the size of the net pots. Through Deep water culture we raised Methi Plants. In future we are planning to develop the Coriander and Wheat grass plants through this unit. This is the Cheapest and low cost hydroponic unit out of all the three hydroponic units.

In preparing the Dutch Bucket Model of Hydroponic unit we procured 10 Plastic buckets used to pack the curd with the capacity of 10 litres. Clay balls cocopeat and gravel are used in place of the soil. All the buckets are interconnected and reservoir with Motor is fitted to circulate the nutrient solution. Through this model we raised tomatoes to certain extent. We are still in the trial basis and the art of growing plants in dutchbucket will be mastered soon. In future we are planning to grow the capsicum plants through this model of Hydroponics.

At present we are freely distributing the leafy vegetables among the staff. The Hydroponic culture is halted for few months due to extreme covid conditions. Later it is restarted and testing on different plants already planned is under the way.

5. Obstacles faced if any and strategies adopted to overcome them

The list of obstacles we faced during the development of hydroponic units and cultivation of plants through hydroponics are as follows

- 1. Some leakages are traced out in the NFT model and they are rectified by fixing the eraldite**
- 2. Water clogging is the main problem observed in the Dutch Bucket model. As we are using cocopeat, clay balls and gravel in equal composition, it led to water clogging in some dutch buckets. We are planning to use perlite though it is expensive, to avoid water clogging and to provide neutral Ph maintenance and growth of plants.**
- 3. Cutting the railway decolum piece and carving the holes equal to net pot size is a huge herculean task. Even with the machine, with most difficulty we could do that. Each Railway decolum lid that closes the tub has 21 holes fitted with net pots.**
- 4. Coming to the culturing plants through hydroponics initially we faced the problems in EC (electrical conductivity) and Ph maintenance. As each plant requires separate set of conditions like EC and Ph, though initially we failed through practice and sharing knowledge with experts we could overcome the problem.**
- 5. Impact of the practice**

In our country Agriculture is intricately wound to the human life. More than 50 percent of the population directly or indirectly are involved in the agriculture related activities. Losses occurred in our traditional agriculture summed up with loss of fertility of Indian soils can be overcome through Hydroponics. Excessive application of fertilizers and pesticides is the reason for the loss of fertility of the soils. In Hydroponics plants are grown in water without soil by supplying the required nutrients externally. Though the cost of commercial hydroponic units is high, it can be recovered very soon in future through bumper production. The production of exotic plants and some native leafy vegetables through hydroponics is more compared to traditional production.

Through Hydroponic practice we could instill the confidence in our students. The Students of our college can now use the disposed plastic bottles, buckets and tubs to grow leafy vegetables in their home itself. With limited resources they can start the hydroponic culture of plants. Through this culture students better understood the metabolism of the plants in general and mineral nutrition of plants in particular. Now everyone wish to acquire pesticide free vegetables it is possible through this novel technique called Hydroponics. In long run if the knowledge of this technique is dissipated through the length and breadth of the country then the citizens are self-sufficient to grow their own leafy vegetables in their limited space by using disposed plastic bottles, buckets

and tubs. This will certainly paves a path for environment friendly culturing of plants by reducing the pressure on soil.

6. Resources required

The resources required for preparing 3 hydroponics units are as follows

1. NFT Unit

- 1) PVC pipes 20 ft – 4, 10 inch
- 2) Reservoir drum 50 l
- 3) 20 watts motor
- 4) T shape pipes for joints
- 5) Eraldite gum
- 6) Net Pots of 2.5 inch
- 7) A type wooden stand - 2
- 8) Couplings Plastic - 32
- 9) Clay balls
- 10) Wire and Plug

2. Deep Water culture Unit

- 1) 10 Plastic tubs with 10 l capacity
- 2) Railway decolum pieces
- 3) 210 Net pots

3. Dutch Bucket Model unit

- 1) Plastic Buckets used to pack the curd – 10, 10 l capacity
- 2) 1 inch pipe 30 ft
- 3) Plastic Tube 0, 5 inch 15 ft
- 4) Eraldite gum
- 5) Clay balls -20 kg
- 6) Coco peat – 20 kg
- 7) gravel- thin – 50 kg
- 8) Wooden sticks -8 (support for the 1 inch plastic pipe)
- 9) 50 l reservoir plastic drum
- 10) Two 40 watts submersive motors pumps

8. About the Institution

- i. Name of the Institution : TRR Govt. Degree College, KANDUKUR
- ii. Year of Accreditation : 2014
- iii. Address : Near Saibaba Temple, Kovur Road, Kandukur.
- iv. Grade awarded by NAAC : B
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HYDROPONICS UNIT – 01 NFT MODEL (Nutrient Film technology)



HYDROPONICS UNIT -2

DUTCH BUCKET MODEL – Tomato plant



HYDROPONICS: DEEP WATER CULTURE- Wheat grass



Best Practice -II

1. Title of the Practice: Distribution of Free Books, Uniform, Bags and donation of fee to the needy students

2. The context that required the initiation of the practice.

Our TRR Government Degree College is one of the prestigious institutions started in the year 1966 to cater the needs of the local rural and especially weaker sections of the society. Most of our students are first generation learners. The parents of the students are daily agriculture labour who strive very hard for the education of their students. Some students are the extra working hands for their family. Under such circumstances paying fee, buying books bags and uniform become burdensome for these low income family of our students. Keeping this point in view our college Principal and staff started helping our students to reduce their financial burden to certain extent. This is age old practice of our college to help our poor students as financial problems should not hinder their interest in studies.

3. Objectives of the practice

- 1. To extend our helping hand to students to come out of the financial problems.**
- 2. To improve the active participation of the students**
- 3. To improve the understanding between teaching and student community**
- 4. To improve the sense of helping nature among staff and students**
- 5. To inculcate moral and social responsibility among staff and students**

4. The Practice

It's an age old practice of our college to help the financially poor students whose parents income is not sufficient to support their studies. The list of poor students is roughly prepared immediately after our door to door campaigning of our teaching staff for admissions. We think that this is the right method of tracing out the financially poor students as we directly see and interact with their parents and analyze their financial status. Through ward counselling our Ward counsellors will understand the problems of our students and bring this to the kind notice of our principal. The principal with the help of Staff Council will finalize the students who are poor and needy. The working staff members, retired Principals of our college extend their helping hands financially to fulfill the needs of the poor students. Every year many students of our college gets benefited by the donations made by the staff members and

local people in the form of distributing free uniforms, college bags, lunch boxes, and paying fee for financially poor students.

5. Obstacles faced if any and strategies adopted to overcome them

The two problems faced in this best practice are

- 1. Tracing out the true poor students from total number of students**
- 2. Limited resources/funds to help the huge list of students.**

Door to door campaign for admission is a boon to understand the students standard of life. Apart from this our well organized ward counselling system help us in preparing the list of extremely poor needy students.

The second problem of limited funds/ recourses can be resolved by involving and motivating all the staff members as well as local public to extend their part of help, as we all are living in the responsible society

6. Impact of the practice

The impact of this practice is tremendous as the understanding between the students and teaching staff has increased a lot. More over a sense of satisfaction of millions worth can be gained through small donations. As a teacher we are inspiring students to walk in the right path. What we do today, tomorrow our students will replicate it. As a teacher we are not only imparting knowledge but also making responsible citizens in the class room. We strongly believe that the Knowledge without social responsibility is nothing.