Congratulations to your college on initiating an agriculture test bed through the e-Yantra Farm Setup Initiative (eFSI)

Aim of eFSI:

This initiative aims at assisting eLSI colleges in setting up an automated agriculture project testbed to address real world problem and hands-on learning for students to apply theory in a fun and productive manner.

e-Yantra transfers the requisite knowledge to setup this test bed and once setup, this testbed will serve as a base for interesting BE projects in the field of Embedded Systems and Robotics.

In order to start applying technology to the farm, we need to setup the 150 sq ft farm.

Depending on the type of space available, you may set up your experimental farm either

- In an open space in your college premises
- In a closed area such as Greenhouse facility - in case your college already has one (you will require troughs in this case
- On a terrace (you will require troughs in this case)

To help you in setting up the farm we have come up with different Checkpoints. They are as follows:

1. **Identifying 150 sq ft space for placing the troughs**
2. **Laying troughs and irrigation system**
3. **Preparing amrit mitthi and amrit jal**
4. **Sowing of seeds**

Checkpoint 0 - Allocation of space

The first step is to identify a group consisting of one faculty and four students(Two - 2nd yr and Two 3rd yr student). You can have more than one group. Once the groups are ready you need to have 150 sq ft space for placing trough and start sowing seeds.

Checkpoint evaluation

The evaluation of this checkpoint will be based on uploading photo/video on the portal, which will also have the group members.

Checkpoint 1 - Trough, Irrigation and Composting

On completion of checkpoint-0, you can now start preparing for sowing. The following steps needs to be followed to complete this Checkpoint

Trough making and laying irrigation system

Step 1: Cut a sheet of length 100cm from the HDPE roll.
Step 2: There are two crease marks on either sides of the sheet along the length. These are used to fold the sheet along the its length. We will make two crease marks along its breadth at a distance of 20 cm each from the edges. These will be used to fold the sheet.
Step 3: Make four crease marks in each corner at an angle of 45 degrees.
Step 4: Make two 8mm holes using a drill machine at a distance of 10 cm from the center on either sides and at distance of 5cm from the edge of the sheet. Repeat this on the other side of the sheet.
Step 5: Fold the sheet along the crease marks to form a rectangular open box
Step 6: Staple the sheets on all four sides using a 26/6 stapler.
Step 7: Place the trough and fill with growing medium.
Step 8: Lay the drip irrigation pipe/tape.
Step 9: Connect all the irrigation pipes to main water supply pipe.

Amrit Mitti

Steps of making is spread across different days,

Day 1

- ➔ Create thick liquid slurry with 1 kg fresh cow dung, 1lt cow urine, 100gm jaggery
- ➔ Add the mixed slurry into 10 liter of water
- ➔ Stir the 11 liter slurry with a stick in clockwise direction (12 times), then in anti-clockwise direction (12 times). Follow the same process of stirring of the 10 L slurry 3 times a day for the next 3 days.

Day 2

- ➔ Stir the 11 liter slurry with a stick in clockwise direction (12 times), then in anti-clockwise direction (12 times) 3 times a day.

Day 3

- ➔ Stir the 11 liter slurry with a stick in clockwise direction (12 times), then in anti-clockwise direction (12 times) 3 times a day.

Day 4

- ➔ Dilute 11 liters of slurry into 100 liters of water which will create 111 liters of Amrut Jal.
- ➔ Mix 20 kg biomass into Amrut Jal and keep it standing for 24 hrs

Day 5

- ➔ Create Heap: 3 feet wide and 1 feet high from wet biomass
- ➔ Create the heap using layers of Biomass, soil and rock-dust (incase soil is less pores)
- ➔ The layer are added as follows
    - ◆ Layer 1 - Biomass
    - ◆ Layer 2: Soil
    - ◆ Repeat layer 1 & 2 up till layer 11
    - ◆ Layer 12: Rockdust
    - ◆ Apply pressure across heap every 10th layer of biomass
    - ◆ Continue the above layering until you reach 1 feet
- ➔ In all there will be approximately 60 layers.

Day 12

- ➔ Turn the heap twice a week and spray Amrut jal to maintain moisture inside the heap. It can be reduced to once in every 7 days in case of shortage of manpower or time add amrut jal and water to keep the heap moist.

Day 19

- ➔ Turn the heap add amrut jal and water to keep the heap moist.

Day 26

- ➔ Turn the heap add amrut jal and water to keep the heap moist.

Day 31

- ➔ Add one layer of soil - approximately 2 inches
- ➔ Sow the seeds
- ➔ Top the seeds with mulch heap with biomass to protect the seeds from birds.

Day 55 (21 Days after germination)

- ➔ Pruning of 25% leaves

Day 76 (42 Days after germination)

- ➔ Pruning of 25% leaves

Day 97 (63 Days after germination)

- ➔ Some plants may start flowering, cut all plants 0.5inch from soil and cut stem into 3-4 inch and keep it on heap for 3-4 days for drying

Day 101

- ➔ Turn the heap and mix biomass
- ➔ Sprinkle Amrut Jal on heap, keep it for 30 days

Day 108

- ➔ Turn heap every 7 days for the next **ONE MONTH** and add amrut jal to keep the heap moist.

Checkpoint evaluation

The checkpoint will be considered complete when the troughs with growing medium and irrigation system are laid, and amrit mitti process has started. You need to upload photos/video on the portal for evaluation.

Checkpoint 2 - Sowing the seeds

For this checkpoint we will sow spinach as an example

Step 1: Soak spinach seed in water/amrit jal for 3 to 4 hrs.
Step 2: Turn bed to loosen soil for aeration.
Step 3: Spread the soil evenly in trough.
Step 4: Sow the soaked seeds, such that they are 2 inches apart and 0.5 cm deep.
Step 5: Sprinkle water so that the soil remain moist to aid germination.
Step 6: Sprinkle water as and when needed.

Checkpoint evaluation

The checkpoint will be considered complete when all the troughs in the 150 sq ft space has growing plants. You need to upload photos/video on the portal for evaluation.

Note: To help further, we will be providing video tutorials which will clearly demonstrate the complete process