

The Planning and Process “Roof Top” Nursery

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Abstract – This paper contains about the planning of roof top nursery. We selected only rose for our nursery. It is very common in western countries. It is contains basic concepts of roof top nursery. It also contains materials and methods of roof top nursery. We grow rose plants on the roof and note the benefits of roof top nursery. The average life of rose plants in nursery stage is one year. We calculate live loads on roof by weight balance. Always keep roof clean and safe during this period.

Indexed Terms: Urban agriculture, Horticulture, Local nursery Building, agriculture, Rooftop farming, Life cycle assessment, Agronomy

I. INTRODUCTION

Rooftop nursery is a small nursery on the roof of a building. Beside the decorative benefit roof top nursery may provide income, temperature control, hydrological benefits, architectural enhancement, habitats for birds, recreation opportunities, and in large scale it may even have ecological benefits.

II. STEPS INVOLVED IN PLANNING OF A ROOF TOP NURSERY

Step 1: Find out property rules of the area where your building or property situated.

Step 2: Get an architect or contractor to find your building conditions like maximum load on roof etc for buildings safety. If your building is fit for roof top nursery then processed next steps.

Step 3: Estimate the total loads calculation on the roof and try to use minimum loads by using plastic, fiberglass, foams etc,

Step 4: Design your nursery and take all information about your nursery which should be placed on the roof.

Step 5: Design and use wind break structures (walls etc).

Step 6: Arrange the water structures for irrigation (tanks, pipes etc).

Step 7: Follow all steps and make roof top nursery

III. BENEFITS OF ROOF TOP NURSERY

- Green roof growing media retain rainwater and, together with plants, return a portion of this water to the atmosphere through evaporation and transpiration.
- Rain water that does leave the roof is delayed and reduced in volume.
- Rain water that runs off a green roof is cleaner than runoff from a conventional roof.
- Retention and delay of runoff eases stress on Rain water infrastructure and sewers.
- Cost savings from decentralized Rain water mitigation reduces the need to expand or renovate related infrastructure.

IV. PREPARATION OF SOIL

Roses appreciate good soil preparation. The best soil to use when growing roses is loam. Loam is about 50 percent air and water with the balance being made up of sand, silt clay, and organic material. With heavy clay soil, mix one part organic material such as composed, dried manure with 2 parts of soil.

Roses prefer a slightly acidic soil range between pH ranges of 5.5 – 7.0.

V. STEPS INVOLVING IN SOIL PREPARATION

1. Determine the type of soil you have and make reformation to get a loamy mix:
 - Clay soil will hold water but does not drain well. Clay soil is usually highly alkaline and will need a lot of organic matter added to it. Adding gypsum will help to improve clay soil and ensure good drainage.

- Sandy soil will drain well but requires frequent watering because it cannot hold water. It will also need to be rectified with organic material.
- Very organic soil is usually highly acidic and it will have both good drainage and moisture retention. You may need to add some lime to increase the pH level as per requirement.

2. Add organic material to your soil:

We buy compost from local shop and collect leaves and organic matter.

3. Dig and aerate soil in each season:

With new rose plant, use a manual tool to turn the soil loose. We have existing roses, turn the soil over near the rose bush and loosen the roots as much as possible, but we careful about the damage the rose bush.

4. Ensure that the soil for roses is dry and friable (easily crumbled):

Pick up a handful of soil and squeeze it. Soil that is too wet sticks together while soil that is too dry crumbles.

5. Check soil for good drainage by:

The water should drain out in around 15 minutes. If it takes much longer or drains too fast your may need to improve the soil.

6. Ensure the soil has a pH of around 6.5, which is slightly acidic:

This is the soil usually found in woods and forests.

- Test the soil with a home kit or send it to a soil testing lab.
- We can raise the pH level by adding lime if the soil is too acidic. If it is too alkaline, add garden sulphur. If roses grow poorly and have yellowing leaves, it may indicate that soil is too alkaline.

7. Add nutrients such as bone meal, blood meal or NPK (Nitrogen, Phosphorous, Potassium):

- A balance of 1:2:1 is best.
- Phosphorous helps roses bloom. Avoid excess Nitrogen because it will cause more foliage growth and fewer blooms.

VI. LAYOUT OF A ROOF TOP NURSERY IN SHEKHAWATI INSTITUTE, SIKAR

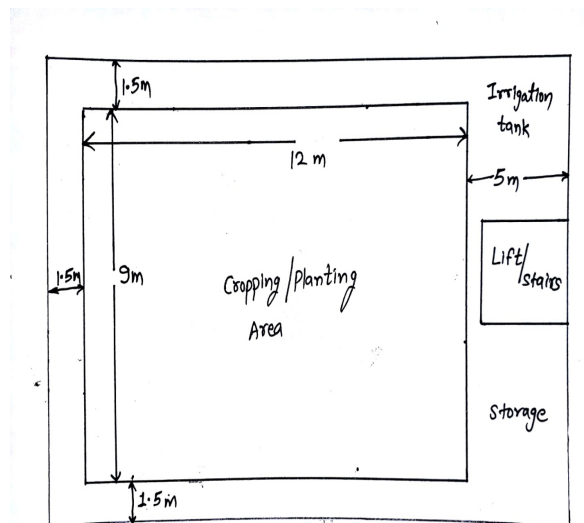


Fig 1: Schematic diagram of nursery

• Planning Area:

This 1.5 m area contains wind breaker and water drain system (walls, pipes etc.)

• Material and methods:

Experimental trial was performed during January 2018 to December 2018 on the rooftop of Shekhawati Institute Sikar. The crops selected for nursery are very easily grown in these climatic conditions. The cropping (Nursery) area was (9m*12m=108m²). Nursery plants are grown in small plastic bags filled with soil. The number of plants is 720.

Spacing was 30*50cm. depth of soil is about 30 cm. soil is clay loam. The wt of soil in each plastic bag is 3 kg. Total wt of soil is 3*720=2160 kg.

The size of irrigation tank was 1000 liters. Irrigation of crop was manually and nutrients also supply by manual methods. Average Life cycle of plants was 2 year.

• Important Materials are used are

- 1) Plastic bags
- 2) Sprayer (manual)
- 3) Plants for nursery
- 4) Horticulture tool kit

- 5) Irrigation tank
- 6) Pipe lines
- 7) Pump

VII. RESULT

S.NO.	Data	Avg values
1	Density of soil (gm/cm ³)	1.30
2	Weight of each bag with soil (kg)	12.1
3	No of plants	720
4	Total wt of bags with soil (kg)	(12.1X720)=8712
5	Height of bag(cm)	30
6	Diameter of bag(cm)	20
7	Volume of bag(cm ³)	9424
8	Depth of plant root(cm)	18.7
9	Avg height of plants from the floor(cm)	42.9
10	Live load of plants on roof in kg(soil +plant)	8729
11	Volume of irrigation tank(m ³)	1
12	Total live load on roof in kg(Plants +Bags +tank +others)approx	10420
13	Total life of nursery plants in years (avg)	1
14	Area of plastic sheet used(m ²) to prevent damp on roof	165
15	Wt of plastic sheet(kg)	21.5

VIII. CONCLUSION

We have grown a nursery on roof top of the building. We can also make a small gardens and nursery on the roof on any buildings. If we increase load capacities of buildings then we can grow food crops for our daily needs known as roof top farming. It is very suitable for cities having no space on land.

It provides suitable temperature to the buildings and increase roof life

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