

## **Irrigation Methods and Their Timing**

Through my interactions with the irrigation team, I discovered that the preferred method for watering during the seedbed stage was manual watering with hoses. The irrigation frequency and timing depended on the daily temperature and humidity levels. In the cooler months of January and February, a light watering every two to three days was adequate. However, starting in March, the watering increased to daily, ideally during early mornings or late evenings to reduce evaporation loss.

The nursery trialed drip irrigation lines in several seedbeds, mainly those located in polyhouse environments. This technique was found to be more effective in saving water and preventing waterlogging, which can harm Petunia seedlings. The nursery manager highlighted the need to avoid overhead watering after germination to reduce the risk of damping-off disease.

## **Weed and Pest Management During Seedbed Preparation**

Weed management at the seedbed level was mainly done by hand. Before planting, the beds were carefully cleared of weeds and then covered with plastic sheets for several days. This was particularly done in late February and early March when the days became warmer. This method was effective in decreasing the number of weed seeds and harmful microorganisms in the soil.

Preventive measures were prioritized for managing pests and diseases. Staff regularly incorporated *Trichoderma harzianum* and *Pseudomonas fluorescens* into the seedbed soil to combat soil-borne fungal issues. Furthermore, spraying neem extract around the seedbeds helped keep aphids and whiteflies away, pests that can harm young Petunia plants. I noticed that yellow sticky traps were also set up throughout the nursery to track pest populations.

## **Seasonal Changes in Techniques (Insights from January to April)**

Changes in the seasons greatly affected how seedbeds were managed. In January and February, the beds were typically prepared in open areas, using transparent polyethylene sheets at night to retain heat. Because of the cooler temperatures, germination took longer, prompting the nursery team to use mini poly tunnels to keep warmth and moisture in.

As the weather warmed in March and April, the seedbeds were moved under shade nets to protect the emerging plants from heat stress. Also, during this period, more cocopeat and sand were added to the soil to enhance drainage, which was essential in the heat. Watering became more frequent, and pest checks were stepped up due to higher pest activity in the warm conditions .

In conclusion, the practices employed in the Rajasthani nursery showcased a careful blend of traditional methods and flexible techniques adjusted to local climate factors. Working closely with the skilled nursery crew and participating in daily seedbed tasks provided me with valuable understanding of the detailed strategies necessary for successful Petunia growth in nursery environments.

## **Recommended Techniques and Scientific Methods**

While interning at a nursery in Rajasthan, I had the chance to collaborate with the nursery team and horticulture specialists, gaining practical skills in preparing seedbeds, specifically for ornamental plants like Petunia. By actively engaging with the nursery team, I grasped and executed a range of scientific and practical methods vital for fostering healthy seedlings. This section details the recommended techniques and scientific methods I noted and applied during my internship.

### **Usage of Nursery Medium: Cocopeat, Vermiculite, and Perlite**

A key aspect of seedbed preparation was the utilization of scientifically approved nursery mediums. The team stressed the importance of mixing cocopeat, vermiculite, and perlite in specific ratios to develop the best growth environment for Petunia seedlings. Cocopeat is excellent at retaining moisture, which is crucial during germination. Vermiculite helps with aeration while holding necessary nutrients, and perlite facilitates proper drainage. The typical mix in the nursery consisted of cocopeat, vermiculite, and perlite in a 3:1:1 ratio. This blend resulted in a light, well-draining, and nutrient-rich medium, encouraging consistent germination and strong root growth.

### **Soil Sanitization and Solarization Techniques**

Maintaining soil health and cleanliness was a major focus. I discovered that untreated soil can host pathogens, weedy plants, and harmful insects. To combat this, the nursery employed soil sanitization and solarization methods. Soil sanitization involved treating the soil with formalin, especially in areas designated for direct sowing. On the other hand, solarization — a more environmentally friendly approach — consisted of covering moist soil with clear plastic sheets during the hottest summer weeks for three to four weeks. This technique effectively elevated soil temperatures to levels harmful to most soil-borne pathogens and weed seeds. The staff highlighted how vital this procedure was for decreasing disease occurrences and ensuring robust seedling growth.

### **Mulching and Covering Methods**

After sowing, holding ideal microclimatic conditions was essential. I noted the use of thin organic mulch layers, like dried grass or shade nets, to shield the plants. Mulching served two purposes: conserving soil moisture and regulating temperature, both critical in Rajasthan's dry climate. Additionally, polyethylene coverings were sometimes utilized during cold nights to retain warmth, aiding germination. These methods minimized evaporation and provided a controlled setting for Petunia seeds to sprout.

## **Significance of Drainage and Airflow**

The nursery staff consistently highlighted the necessity of proper drainage and airflow. Seedbeds were elevated by about six to eight inches above the ground to prevent water accumulation, particularly during watering. Soil mixtures were carefully assessed to ensure they were loose and permeable. Ample airflow in the medium allowed roots to access oxygen, reducing risks of fungal infections and root rot. I also learned that routinely loosening the topsoil layer helped maintain air circulation and encouraged root growth.

## **Preparation of Beds for Transplantation**



In conclusion, preparing beds suitable for transplantation was a crucial aspect of managing the nursery. When the Petunia seedlings developed 4 to 6 leaves, they were gently moved to larger beds or polybags. These new areas had been enriched beforehand with well-composted farmyard manure and a measured amount of NPK fertilizers. The soil in these beds remained light and allowed for good drainage to lessen transplant shock. I participated actively in this phase, gaining skills in how to uproot seedlings carefully without disturbing the roots too much and how to space them correctly for optimal growth.