

WINTER CARE GUIDELINES FOR GREENHOUSE CROPS

The unprecedented heavy rains that occurred in many parts of our country during the whole of October, has had a huge impact on the agriculture sector, not to mention its long standing implications on the protected cultivation segment. This paradigm shift in the climatic pattern, prompts us to cater to the varying physiological needs by providing precise technical guidance to the growers. Temperature levels going below 18 ° C and above 38 ° C, for prolonged periods of 1 week or more can prove to be detrimental to the crop.

The Rise n Shine Technical team wishes to send across few tips and guidelines to help the grower cope up with the changing scenario.

Effect of winter on plants:

- Low air and soil temperatures: This leads to reduced root activity, thereby reducing the nutrient uptake of plants and ultimately slowing down the growth of the plant considerably during this period.
- Phosphorus deficiency (Dark purple colouration of leaves).
- Reduced photosynthetic activity due to low light levels, thereby reducing crop production.

To reduce the above mentioned ill effects of winter, a few greenhouse operational, cultural and chemical measures can be adopted.

Greenhouse Operations:

- **Top plastic:** Since the season preceding to winter, was the monsoon season, it is very likely that the top plastic sheet of the greenhouse would be covered with algal growth. Thoroughly clean the top polythene sheet. This operation will ensure uninterrupted light penetration into the greenhouse. This will eventually help in the soil moisture evaporation as well. A word of caution for areas where the light intensity peaks during mid noon hours. Here the top shade net operation plays a vital role in cutting down the light intensity.
- **Top shade net:** Winter season is characterized by short day periods and lesser light intensities. To counter this effect, keep the top shade nets open all through the day. This will enhance the photosynthetic activity to a considerable extent coupled with an increase in greenhouse temperature. Similarly, close the top shade net during the night time, which helps to retain the heat developed during the day time.
- **Side curtains:** During late morning hours as the temperature starts rising, open the side curtains and promptly close them during early evening hours, before the temperature begins to drop.

Cultural Operations:

- Rake the soil at frequent intervals to enhance root development, increase soil temperature and improve soil moisture evaporation.
- Remove old and dried leaves to maintain an ideal crop microclimate. Retain around 20 – 25 healthy leaves in plants that have reached the generative phase. High humidity levels in the crop canopy will serve as an ideal medium for germination of disease causing spores, mainly Powdery Mildew. The old leaves covering the sides of the bed need to be removed.
- Carefully monitor the soil moisture levels. The surface level may appear dry while the layers beneath would possess ample moisture as the evaporation losses are considerably less. In this case too, raking is beneficial. The frequency of fertigation is decided based on this observation.

- A month before the onset of winter incorporate Neem cake @ 500 kg/acre. This neem cake should be the one without oil. Before application of Neem cake, ensure that the soil EC levels are within normal range, as neem cake will further increase the EC levels. A month after application, detailed analysis of the soil needs to be carried out, after which the winter fertigation can be formulated. Addition of any type of organic matter into the substrate / soil is beneficial prior to the onset of winter.

Chemical Measures:

- Regularly monitor the soil EC and pH, to ensure that the plants are not deprived of nutrients or there is no excess leading to toxicity or antagonism. Under cool and wet conditions plants tend to absorb excess ammonium leading to ammonium toxicity which appears as interveinal chlorosis of older leaves which can progress to cell death.
- Humic Acid drenching once a fortnight will enhance root growth and activity.
- Plants indicating Phosphorus deficiency can be drenched with 12:61:0 (1 gm/lit), twice a week @ 100 ml/plant.
- Silica drenching @ 0.3 ml/lit. once in 15 days. Silica helps in releasing the tied up phosphorus, thus increasing the availability for plant uptake.
- Since the soil moisture rate of evaporation is less, the fertigation frequency may be less. Under such situations, when fertigation is given after a longer gap, the EC of fertigation solution can be raised upto 1.8 mS/cm.
- Foliar spray of 13:40:13 @ 1 gm/lit once in 10 days.
- Foliar spray of Stim Rich @ 1 ml/lit once in 10 days.
- Winter season is the ideal period for the incidence of Cyclamen mites. Thorough scouting of the plants is essential. The newly emerging leaves need to be monitored.
- Incidence of Powdery mildew is also flared up especially in varieties having dense foliage growth. Careful monitoring of the side beds is essential to detect the pathogen initiation.
- Plants in generative stage may tend to produce limpy / thin and slender flowers and shoots. Physiological disorders like floral malformations are also observed. Weekly foliar sprays having Calcium and Boron source can be administered in plants that are in the generative phase.



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Note: The above mentioned points are the general guidelines. However, depending on the existing conditions in the greenhouse alterations have to be made.