

# FOLIAR APPLICATION OF NITROGENOUS FERTILIZERS IN FRUIT CROPS

## Exercise

Foliar application of nitrogenous fertilizers in fruit crops.

## Objectives

- To learn the benefits of foliar application of nitrogenous fertilizers in fruit crops

**Delivery schedule:** 01 period

**Student expectations / learning objectives**

- To know what is foliar application
- To learn the foliar application methods
- To learn how the nitrogenous application can be beneficial to fruit crops

**Handouts / material / equipment's & tools required:** Paper sheet and pen to note down the different types of fertilizers, water soluble fertilizer, buckets, small sprayers and gloves.

**Pre-learning required:** Pre-requisite knowledge about foliar applications and its importance in fruit production.

## Introduction

Plants require nutrients for better growth and development. The nutrients normally available to plants from soil. The nutrients will be available in a slow manner. There are other methods of application that can increase the efficiency of nutrient availability to the plants. These are fertigation and foliar application. Foliar application is the process where the fertilizers are dissolved in water and such diluted solutions are sprayed directly on the plants foliage, either through a hand operated sprayers for individual trees or for a small holdings or through a tractor drawn high volume sprayers for medium farms or by means of aircrafts for foliar spray on large scale.



Nutrient hand sprayer

## The main points to be remembered

- Foliar application of nitrogenous fertilizer in order to supplement a part of their nutritional requirement.
- Foliar application of nitrogenous fertilizer helps to rectify the nitrogen deficiency quickly.
- Mostly urea is used as nitrogen sources for foliar application.

- Normally foliar applications are given at a very low concentration. However in special cases such as to regulate a crop or to defoliate for a specific reason higher concentration (5-10 percent ) of urea can be used.
- Spraying of foliar nitrogen early in the morning will be ideal.
- Avoid spraying on windy days, mid-day or rainy day.
- Water-soluble formulations generally work better for foliar applications as they are easily dissolved in water.

Before thinking of foliar spray of nitrogenous fertilizers, one should also decide the type of fertilizers to be used, at what concentration , the crops to be sprayed upon, the season and time of spraying.

#### For teachers...

- Make students to understand the different method of fertilizer application and the importance of these methods in the production of fruits.
- Practically, show the students, different types of fertilizers and precaution required during spraying on fruit plants.
- Ask the students to dissolve the fertilizers in water and practice spraying of fertilizer.



High volume tractor mounted sprayer



Aerial sprayer

### Foliar application of nitrogenous fertilizers

We should know the different nitrogenous fertilizers suitable for foliar spray. Some of them are presented in table.

Name of Fertilizers	Nitrogen Content (%)
Biruet free urea	21.0-44.0
Ammonium polyphosphates	10.0-21.0
Orthophosphates (liquid)	3.0-16.0
Calcium Nitrate	15.0
Potassium Nitrate	13.75
Ammonium thiosulfate	12.0
Ammonium sulfate solution	8.0

**Nitrogen materials:** Urea is the most suitable nitrogen source for foliar applications, due to its low salt index and high solubility in comparison to other nitrogen sources. However, the urea utilized in foliar sprays should be low in biuret content as it reduces the foliage burning symptoms. Other sources of nitrogen are listed in the table. A relatively new nitrogen compound, Triazone ®, which was developed in the late 1970's, has ideal uses in foliar applications due to its low-burn characteristics.

## Steps involved in foliar applications

- Select a water soluble nitrogen fertilizers, for example urea
- Weigh required quantity of fertilizer for spraying. The quantity of urea may vary depending upon the concentration of the solution and the spray volume to be sprayed. For example, the concentration of spray solution is 0.1% urea and the spray volume is 100 litres of water, now the quantity of fertilizer needed for spraying is 100 g (1 g in one litre = 0.1 %, therefore for 100 litre , you multiply with 100 that  $100 \times 1 \text{ g} = 100 \text{ g}$ )
- Dissolve the known quantity of fertilizer in the water and stir it until the fertilizer gets completely dissolved. Now this solution is called as the nitrogenous spray solution
- Add some wetting agent like soap solution or tepol in order to get sticky to the leaf surface for longer period
- Fill the solution in the sprayer of your availability (hand sprayer or foot sprayer or tractor mounted power sprayer)
- Spray operation should be done either early in the morning or in the late evening
- Take precaution while spraying like covering the face with mask and wear proper gloves
- The sprayer should be cleaned after every spraying operation

## Students Activities

1. Make attempt to train yourself for making water soluble fertilizers solutions.
2. Make a list of materials required for spraying.
3. Visit to a fruit orchard which is near to the school and attempt to apply the nutrients through foliar method.

## Study Material

- Bal, J. S. (2007). Fruit growing. Kalyani Publishers, Ludhiana, India.
- Chadha, K. L. (2001). Handbook of Horticulture. ICAR, New Delhi.
- Chattopadhyay, T. K. (2008). A textbook on Pomology, Vol. 1-4 (Fruits), Kalyani publishers, Ludhiana, India.
- Sharma, R. R. (2006). Fruit Production: Problems and Solutions. International Book Distributing Company. , ISBN 81-8189-102-3
- Swietlik, D. and Faust, M. (2007). Foliar nutrition of fruit crops **In:** Horticultural Reviews, Volume 6, 1984