

## Lesson 7

# Foliar Analysis

40 minutes

## Objectives

- ▲ Describe the reasons and conditions for using pre- and post-fertilization foliar analysis
- ▲ Describe the time line and guidelines for collecting field samples and preparing them for shipment to a laboratory
- ▲ Examine the use of the critical level approach for the interpretation of the laboratory analysis

## Equipment Needs

- ▲ Overhead projector
- ▲ Lesson 7 transparencies

## Method

Lecturette with overheads, exercise and class discussion

## Instructions

The subject matter for this lesson is found in Appendix 2 of the *Forest Fertilization Guidebook*. The purpose is to provide sufficient information for participants to collect foliar samples for analysis and interpret the laboratory results for use in stand selection. The commonly accepted critical level and interpretation tables will be explained and used in optional exercises located in the lesson with additional exercises in the appendix.

Key points to this lesson are:

- ▲ Foliar analysis should only be undertaken after a candidate stand meets strategic/wood supply, biological and operational criteria. Adequate time must be scheduled for the laboratory analysis.
- ▲ Distinguish between the differing purposes of pre-fertilization and post-fertilization foliar analysis.
- ▲ Review the methods of collecting foliage samples.
- ▲ Present drying methods of foliar samples prior to shipping to the laboratory.
- ▲ (*Optional*) Use the interpretation tables contained in the appendix to diagnose several examples of foliar analysis from a lab.



Foliar analysis is the chemical analysis, conducted by a laboratory, of the twelve nutrient elements important for tree growth. The results can be used to infer the nutrient status of a stand but not necessarily the reasons for a nutritional problem. Care must be taken when using foliar analysis for the purpose of prescribing fertilization. Foliar analysis is most useful for the identification of the severely deficient nutrients. Interpretative criteria are not available for all of British Columbia's tree species or for some elements; therefore, it is necessary to check the diagnostic criteria before sampling.

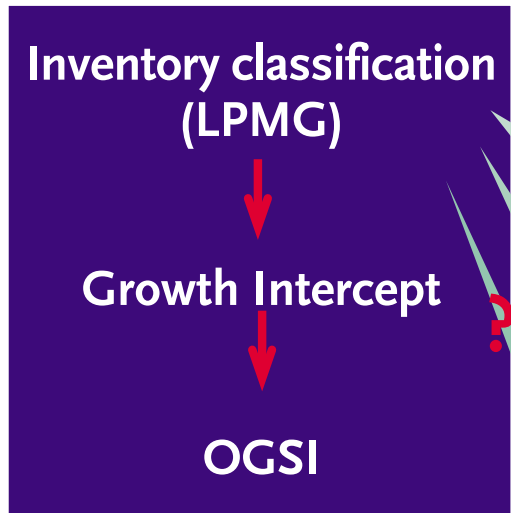
It is assumed that the stand selected for fertilization will utilize the applied nutrients quickly and produce improved tree growth. However, as part of program monitoring procedures, one should consider the use of pre- and post-fertilization foliar analysis. Foliar analysis can be used to measure nutrient status both before and after the fertilization treatment of the stand to quantify the increases in foliar nutrient levels and to identify any induced deficiencies. Therefore, on occasion, where a pre-fertilization foliar analysis is conducted to assist in the prescription for fertilization, and especially where mixed nutrient fertilizers are used, consider the use of post-fertilization foliar analysis.

There are seven foliar sampling guidelines to follow; these are listed in Appendix 2 of the *Forest Fertilization Guidebook* and below. The important points are to sample at the correct time of year, from dominant and co-dominant trees, away from foliage contamination sources, and to handle samples in the recommended manner. The samples of foliage can be collected using any of four techniques, often depending on the height of sample trees.

Computer-based programs are available to assist in the interpretation of the results from foliar analysis or the simple approach of comparing the laboratory results with the diagnostic critical level where it is available for that tree species. This latter approach is used with this course, in which a scenario is explained and the foliar analysis results provided.



## Biological Assessment of Site Productivity



## Tools to Determine Fertilization Potential

Screening Trials

Foliar Analysis

Other (PSPs)



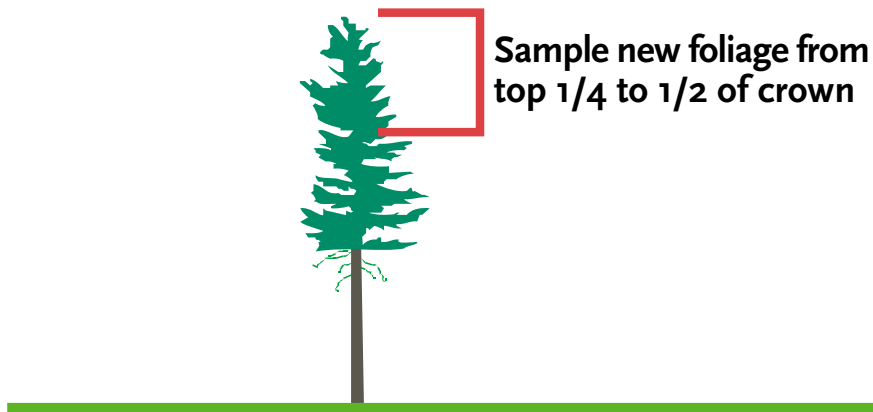






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## Foliar Sampling Guidelines (con't)









# Foliar Analysis

## Pre-fertilization

- ▲ Composite samples from representative locations
- ▲ Stratify samples if necessary
- ▲ Complete laboratory analysis

## Post-fertilization

- ▲ Needle weights
  - ▲ Representative locations across flight lines
  - ▲ Complete laboratory analysis
- \* Contact regional Stand Tending Forester or Rob Brockley, Kalamalka Research Station

