

REPORT ON THE NORTH AMERICAN FOREST SOILS WORKSHOP¹

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ABSTRACT

The purpose of the workshop was the need for a technical update on forest nursery soils. Highlights of the workshop indicate, generally, that maintenance of proper soil structure is essential; a certain soil moisture should be maintained; seedling survival increases with decrease in seedbed density; etc. The entire proceedings of this workshop will not be available until 1981, however, the results of the workshop indicate that soil is an essential phase of nursery soil management and deserves continued study.

INTRODUCTION

This workshop developed as a result of the increased awareness of many nurserymen that a technical update on forest nursery soils was sorely needed. The first such workshop was held in 1965 and the state-of-the-art has undergone obvious changes in the past 15 years.

This workshop was held during the week of July 28-August 1, 1980, at the College of Environmental Science and Forestry of the State University of New York at Syracuse. It was jointly sponsored by the USDA-Forest Service, the Canadian Forestry Service, and the University.

It was appropriate that the workshop was dedicated to the memory of Dr. A.L. Leaf, who was such a vital force in the study of nursery soils. Dr. Leaf was one of the principal organizers of the workshop and his untimely death last summer threatened its existence. Only through the special efforts of Dr. Leaf's friends and coworkers could the work have gone on as planned.

The workshop attendance was truly remarkable, with nurserymen and forest scientists from across the United States and Canada. The official registration totaled 180, of which 34 were Canadians. The participants formed an ideal mixture of practicing nurserymen and leading researchers.

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OBJECTIVES

The objectives of the workshop included: (1) To review basic concepts of forest soils as they apply to modern nursery management; (2) to discuss soil testing procedures and their meaning to nurserymen; (3) to develop the proceedings into a reference book for the special field of nursery work.

FINDINGS

The proceedings of this conference will not be available until next year, so I would like to pass along certain highlights, which you may find of interest:

On seedling grades and quality

1. Stem diameter or caliper is the best single morphological index of seedling quality.
2. Plant moisture stress and root regeneration capacity are the best physiological measures of seedling quality.
3. Seedling outplanting survival increases with a corresponding decrease in seedbed density. Examples: pines 18-25/sq. ft.; spruce 25-30/sq. ft.

Soil physical properties

1. Soil structure is one of the most critical aspects of nursery soils because, for practical purposes, long-term changes are not possible.
2. Maintenance of proper soil structure is essential because soil pores are more important than soil solids.
3. Organic matter sources are becoming limited and the best solution may be to grow your own.

Irrigation practices

1. Soil moisture retention curves are necessary for proper irrigation scheduling.
2. As the quality of irrigation increases, differences in fertilizer responses disappear.
3. Soil moisture levels should be maintained between 0.3-1.0 bar of tension, which is more moist than traditional recommendations.

Soil Biology

1. Soil fumigants are most effective against pathogenic organisms and usually cannot be economically justified for weed control alone.
2. Newly registered herbicides have not adversely affected mycorrhizal levels in nursery soils.
3. A commercially available ectomycorrhizal inoculum is being tested and may be available if marketing problems can be overcome.

Soil fertility

1. Considerable growth loss occurs before visible symptoms of nutrient deficiencies become apparent.
2. High soil pH and salinity levels are a site selection problem, but can be overcome by proper soil and irrigation practices.

Cultural practices

1. Seed stratification periods should be lengthened beyond the Woody Plant Seed Manual recommendations, as these data were obtained under laboratory environments.
2. Management practices, such as bed density, root wrenching, and lifting date, are at least as important as irrigation or fertilization.

CONCLUSION

The attendee input gathered at the closing session was generally positive, with the major criticism being that more emphasis could have been given to interpretation of soil test results and on-the-ground problems.

Workshop proceedings will be available in early 1981, from Regional Offices of the Forest Service and from the State University of New York at Syracuse. I will be contacting all those on my mailing list as soon as they are received in my office.

It was agreed that these specialized workshops are valuable and should be held every 5-10 years. Shorter workshops could be held in conjunction with yearly nurserymen's meetings.

The State University of New York at Syracuse Soils Laboratory will continue processing nursery soil samples on a request basis. Forest Service sponsorship of soils testing will no longer be available because of funding restrictions.

We are currently working with soil scientists to develop a set of standardized techniques for nursery soil testing. Ideally, we will be able to request standard soil tests from local testing laboratories which will minimize turnaround time and encourage special treatment of local soil conditions. The most challenging problem will be to engage local soils experts to provide test data interpretation.

Soil is an essential but complicated phase of nursery soil management, but one that, I am sure you agree, deserves continued attention.