
Preface to Anatomy & Morphology: Beyond Height, Diameter, and Germination

In the 70 years that Canadian nurseries have grown conifer seedlings for reforestation programs, improvements in seedling quality have come about through improvements to seed germination (seed collection, processing, handling, storage, stratification) and nursery environmental controls that have hastened and increased height and diameter growth. Although improved germination and increased seedling size have been important crop changes, the grower should be aware of other characteristics that can affect seedling quality. It is possible to obtain seedlings that have taken the same time to grow, have achieved the same height and the same diameter, yet have a different morphology and anatomy and, as a consequence, may perform differently in the field. The objective of this series is to assist growers in developing an appreciation for the details of seed and seedling form and structure, leading to a better understanding and communication of what nursery cultural practices can and cannot do.

Plant morphology and anatomy are concerned with the form and structure of plants. By contrast, plant physiology is concerned with the functioning of plants. Plant morphology describes the exterior features of the plant or its parts—it describes characteristics that can be seen, without dissection, by the unaided eye. Plant anatomy describes the internal structure of the plant and its parts—describing the organs, tissues, and cell types as seen by dissection and often requiring magnification. Morphological and anatomical features are the end products of the interaction of the processes of plant development with the environment.

Although an understanding of the development of form, structure, and function is necessary for the cultivation of seedlings, a detailed integration of these features is beyond the scope of this series.

This series includes volumes on seed, buds, stems, foliage, and roots. Each volume provides an account and a description of these features and their relevance to conifer seedling growers. As a whole, the series seeks to bring together information and illustrations on conifer seed and seedling anatomy and morphology. Its content, organization, terminology used, illustrations, and type of presentation have been carefully selected with the conifer seedling grower in mind. It is not intended as a comprehensive review for the scientific community. The series contains many illustrations that are intended to reinforce and clarify the text. While many of the illustrations in the series have been obtained using techniques and equipment not available to growers, the structures illustrated can be readily identified using simpler techniques and less specialized equipment.

The descriptive content of the series is based on examination and experience with seed and seedlings. Many references on conifer seed and seedling anatomy and morphology of the last century have been reviewed and cited to provide the reader with reference to more comprehensive treatments of individual topics. Conflicting use of terminology has prompted us to choose the most informative, or in some cases, simplified terms to more effectively communicate the subject matter. We have included a glossary of terms presented in

bold text, and provided synonyms to assist the reader when consulting other literature. We hope that this series can provide growers with the vocabulary necessary to communicate their successes and better describe their problems.

Throughout our consultation on conifer seed and seedlings, a common question that has been asked is, “What am I looking at?” This series attempts to answer that question and to encourage growers to look more closely at their seedlings.

By referring to the illustrations, with seed and seedlings in hand, we hope to acquaint the grower with the smaller details that can make a significant difference to understanding crop culture. Although we have attempted to answer the “So what?” question so often posed by growers, it is, in the end, only the user of these series who can establish the authority of “So what?” for themselves.

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