Seed Testing: Principles and Practices


Seed testing is an important component of the distribution and trade of seeds and provides a standardized evaluation of seed quality for both buyer and seller, while also informing the farmer or end-user with an indication of how the seeds will perform when planted. Seed testing also provides the data on seed quality that is required for seed labeling, inventory management, and germplasm conservation. Tests for seed-borne diseases also support phytosanitary and quarantine regulations to prevent the spread of pathogens. Despite the importance of seed testing in agriculture, much of the information on the procedures used in testing seeds is contained in the rules of national and international associations, such as the Association of Official Seed Analysts (AOSA) and the International Seed Testing Association (ISTA), and is not readily available to a broad audience. That has now been rectified by the publication of Seed Testing: Principles and Practices. This comprehensive book on the topic, written by four experts in the field, provides an historical review and a practical guide to the various types of seed tests, how the tests are conducted and how the results can be interpreted and applied.

The book opens with a chapter on the rationale for seed testing and a review of the history of such tests and the organizations involved in standardizing and monitoring them. This is followed by a chapter describing the basics of seed and seedling development and morphological structures important for seed analysts to identify and evaluate. With this background, the next nine chapters present detailed descriptions of the key components of seed testing and the different types of tests that are commonly performed. The topics include seed sampling and subsampling, testing for physical purity, germination and viability testing, seedling evaluation, tetrazolium testing, vigor testing, genetic and varietal purity testing, seed health testing, and seed moisture content testing. This is followed by a chapter on the management, accreditation, and quality assurance of seed testing laboratories and one on statistical applications to seed testing. The book contains a useful glossary and an index.

Within each chapter, the authors explain clearly the intent of the particular procedure or test, how it is performed, how the official AOSA or ISTA rules are applied, and how the outcomes are evaluated. The book is well illustrated with color plates and drawings showing both methods to be used and the diagnostic features to be observed in the tests. The diagnostic features to be observed in the tests. The types of variants that can be expected and how they should be evaluated by an analyst. The seed vigor testing describes the rationale and the major vigor tests (e.g., accelerated aging and controlled deterioration tests, conductivity tests, cold tests, and speed of germination tests). These chapters cover the most common seed viability and vigor tests and provide detailed descriptions of how the tests should be conducted and evaluated. The authors note that the book does not by itself substitute for the official rules but provides a clear and useful guide to the principles and practices behind those rules and aids in their interpretation.

A lengthy chapter is devoted to genetic and varietal purity testing. Although seed purity with respect to weeds, or seeds of other varieties or crops, is an important component of seed testing, changes in the seed industry have resulted in increased emphasis on commercialization of genetically engineered crops. In addition, the increased biodiversity of crops in recent years has resulted in the need for increased genetic and varietal purity testing. The chapter on this topic provides a comprehensive overview of the genetic and varietal purity testing procedures and the use of these tests in seed quality testing.