DOI: 10.25695/AGRPH.2018.02.05

INTROSSCOPIC METHODS OF SEED QUALITY EVALUATION: STATE OF PROBLEM AND PROSPECTS OF REALIZATION

N. S. Priyatkin[1], M. V. Arkhipov[1], L. P. Gusakova[1], N. N. Potrakhov[2], G. I. Kropotov[3], I. A. Tzibizov[3], I. A. Vinerov[3]

[1]Agrophysical Research Institute, 14, Grazhdanskiy pr., St. Petersburg, 195220;
[2]First Electrotechnical University «LETI», 5, Professora Popova St., St. Petersburg, 197376;
[3]Tydex LLC, 16, Domostroitelnaya St., St. Petersburg, 194292
E-mail: prini@mail.ru

The paper presents a review of introscopic methods for seed quality evaluation: multispectral visualization, laser photometry, phosphorescence method, microfocus X-ray, computer microtomography, magnetic resonance imaging, gas-discharge visualization, terahertz imaging. The paper describes the main principles of the methods, hardware and the software for their realization and the key technical parameters of devices used in the evaluation of seed quality. The comparative characteristic of the introscopic methods is given considering the following formulated criteria: maintaining of the object viability; the study of both air-dried seeds and seedlings; obtaining characteristics of an individual seed; possibility of working with seeds of any crops; objectification of the observations; possibilities to study additional (for example, biochemical) characteristics of seeds; speed of measurements and data processing; the cost of technique. The main directions of the potential application of introscopic methods in seed breeding and industrial seed production are following: pre-sowing express assessment of seed quality; quality control of food grain during harvesting and storage; input and output control of grain consignments at storage and refreshing; assessment of efficiency and correction of agrotechnologies; forecasting of germination and bioproductivity of plants; fundamental researches in seed breeding.

Key words: introscopy of seeds, measurements, seed quality.