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Efisiensi Beberapa Substrat dalam Pengujian Viabilitas Benih Berukuran Besar dan Kecil

Efficiency of Several Substrates for Seed Viability Testing of Large and Small Seeds

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ABSTRACT

The quality of paper substrate for seed viability testing is determined mainly by the variety and amount of the papers. A study was conducted to find alternative paper and the optimum amount of paper for testing the viability of large and small seed with the rolled paper method. Two experiments were carried out at the Seed Science and Technology Laboratory, Bogor Agricultural University during April–September 2004 and July–December 2007. First experiment: large and small seeds represented by 5 plants (angled loofah, pumpkin, garden pea, bitter gourd, yam bean) and 7 plants (sorghum, cucumber, mungbean, soybean, horenzo, radish and wheat), respectively, were tested on 4 different paper substrates (straw, stencil, CD, and HVS) following the rolled paper method. Second experiment: large seeds of maize and ground nut, and small seeds of rice and mungbean were tested on paper substrates selected from the first experiment, straw, stencil, and CD, with different number of sheet, i.e. 2, 3, 4, and 5 sheets. Each plant seed was considered as an experiment and a randomized block design was applied to all experiments. The result indicated that for the large seeds, stencil and CD papers had equal and high similarity with the reference straw paper substrate, 100% and 80% for germination percentage and dry weight of normal seedlings, respectively. For the small seeds, only stencil paper showed high similarity for germination percentage variable, 86%, with the reference paper, whereas the other paper showed lower similarity, 57% for both CD and HVS papers. The second experiment showed that 2 sheets of straw, stencil or CD papers were enough for testing viability of large and small seeds to obtain germination percentage, but ground nut needs 4 sheets of straw paper. For vigor index variable, efficiency of substrate paper on large and small seeds varied from 2 to 4 sheets.

Key words: substrate efficiency, rolled paper method, straw paper, seed size, viability testing

PENDAHULUAN

Penelitian substrat alternatif pengganti kertas merang untuk menguji viabilitas benih dengan metode UDK pada benih kecil dan UKDdp pada benih berviabilitas tinggi dan rendah menunjukkan bahwa kertas stensil memiliki tingkat kesamaan tertinggi dengan kertas merang dibandingkan jenis kertas lainnya seperti kertas buram/CD (Purbojati dan Suwarno, 2006; Suwarno dan Hapsari, 2008). Di dalam penelitian ini kertas merang merupakan kontrol/acuan karena memiliki daya regang yang sama dengan kertas blotter putih (1.10%), kadar α selulosa 42.7% dan kekuatan tarik 0.311 kg/cm (Sadjad, 1987) dan dapat digunakan untuk pengujian viabilitas benih selain kertas blotter, towel dan filter (Sutopo, 2002).

Menurut ISTA (2005) persyaratan media kertas untuk pengujian viabilitas antara lain harus memiliki kapasitas menahan air yang cukup selama periode pengujian benih untuk memastikan kontinuitas suplai air bagi pertumbuhan benih. Optimasi media terutama kelembabannya, selain ditentukan oleh jenis kertas dan ketebalannya (jumlah lembar kertas/unit media), juga ditentukan oleh ukuran benih yang akan diuji. Ukuran benih merupakan faktor penting karena jumlah air yang diperlukan untuk pertumbuhan benih berukuran besar berbeda dengan benih berukuran kecil. Penelitian Suwarno dan Hapsari (2008) menunjukkan bahwa pada kertas Samson yang kapasitas menahan airnya 9.27 g air/media, benih jagung hanya mampu berkecambah normal 50.7% sedangkan benih padi 97.3%. Al-Karaki (1998), yang meneliti tentang pengaruh ukuran benih terhadap penyerapan air dan perkecambahan benih lentil (*Lens cullinaris* Medik.), menyatakan bahwa benih berukuran besar menyerap air lebih banyak dan lebih cepat dibandingkan benih berukuran sedang dan kecil. Menurut Boyd dan Van Acker (2004) kecepatan imbibisi dipengaruhi oleh ukuran benih dan difusivitas air ke dalam benih.

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