EFFECT OF VERMICOMPOST PRIMING ON SEED VIABILITY AND VIGOR, AND PLANT GROWTH OF EXPIRED COMPOSITE MAIZE VARIETIES

THEODORE HESED ROGER

DEPARTEMENT OF AGRONOMY AND HORTICULTURE
FACULTY OF AGRICULTURE
IPB UNIVERSITY
BOGOR
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Bogor, March 2026

Theodore Hesed Roger
A2401211127

ABSTRAK

THEODORE HESED ROGER. *Effect of Vermicompost Priming on Seed Viability and Vigor, and Plant Growth of Expired Composite Maize Varieties*. Supervised by SATRIYAS ILYAS.

Penelitian ini mengevaluasi pengaruh *vermicompost priming* (Vp) terhadap viabilitas dan vigor benih serta pertumbuhan tanaman tiga varietas jagung komposit yang telah kedaluwarsa (benih telah disimpan 3 tahun pada kondisi ±20 ºC, RH 60–65%). Penelitian ini menggunakan desain split-plot dengan empat ulangan, menggunakan tiga varietas jagung komposit (Sukmaraga, Lamuru, dan Srikandi Kuning) sebagai plot utama. Sub-plot terdiri atas kontrol tanpa perlakuan, dan Vp 5% selama 18 jam. Perlakuan Vp ini diterapkan dalam studi laboratorium yang menguji viabilitas dan vigor benih setelah penyimpanan ulang selama 3 bulan pada kondisi ±20 ºC, RH 65% (percobaan 1) dan studi lapangan yang mengevaluasi pertumbuhan tanaman (percobaan 2). Hasil percobaan 1 menunjukkan bahwa Vp yang diikuti penyimpanan ulang selama 3 bulan menurunkan secara signifikan viabilitas (daya berkecambah turun dari 91,0% menjadi 84,8%) dan vigor benih (indeks vigor), yang mengindikasikan bahwa *priming* dan *redrying* benih yang tidak optimal (kadar air benih menjadi 12,5% lebih tinggi daripada kadar air awal 10,4%), diikuti dengan penyimpanan 3 bulan menyebabkan deteriorasi lebih lanjut benih yang telah kedaluwarsa. Percobaan 2, performa lapangan lebih didorong oleh faktor genetik; Sukmaraga dan Lamuru menunjukkan ketahanan yang lebih baik dibandingkan dengan Srikandi Kuning. Perlakuan Vp pada awalnya memicu perlambatan pertumbuhan (*growth lag*) di mana benih memprioritaskan perbaikan metabolik daripada perkembangan fisik. Hasil penelitian menunjukkan bahwa *vermicompost priming* tidak dapat sepenuhnya memperbaiki kerusakan fisiologis pada benih jagung yang telah disimpan selama 3 tahun.

Kata kunci: benih kedaluwarsa, daya berkecambah, daya tumbuh, indeks vigor, penyimpanan benih

ABSTRACT

THEODORE HESED ROGER. Effect of Vermicompost Priming on Seed Viability and Vigor, and Plant Growth of Expired Composite Maize Varieties. Supervised by SATRIYAS ILYAS.

This study evaluated vermicompost priming (Vp) on seed viability and vigor, and plant growth of three 3-year-aged (expired seeds stored at ±20 ºC and RH 60-65%) composite maize varieties. This study followed a split-plot design with four replicates, using three composite maize varieties (Sukmaraga, Lamuru, and Srikandi Kuning) as main plots. The subplots consisted of the untreated control and 15% vermicompost priming for 18 hours. This Vp seed treatment was applied across a laboratory study testing seed viability and vigor after 3-month re-storage at ±20 ºC and RH 60-65% (experiment 1) and a field study assessing plant growth (experiment 2). The result of experiment 1 showed that Vp, followed by 3-month re-storage, significantly reduced seed viability (germination fell from 91.0% to 84.8%) and vigor (vigor index), indicating that the priming-suboptimal redrying (seed moisture content becomes 12.5% higher than the initial moisture content of 10.4%), and subsequent 3-month storage cause further deterioration of expired seeds. In experiment 2, field performance was driven by genetics; Sukmaraga and Lamuru exhibited superior resilience compared to Srikandi Kuning. Vermicompost priming did not improve field emergence and survival. Results suggest that vermicompost priming cannot fully mitigate the physiological damage of 3-year-old seeds.

Keywords: aged seeds, field emergence, germination, seed storage, vigor index

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THEODORE HESED ROGER

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DEPARTMENT OF AGRONOMY AND HORTICULTURE
FACULTY OF AGRICULTURE
IPB UNIVERSITY
BOGOR
2026

Examiners Outside the Supervisory Committee on Undergraduate Thesis Examination:
1. Dr. Ir. M. Rahmad Suhartanto, M.Si.
2. Dr. Ir. Megayani Sri Rahayu, M.S.

Undergraduate Thesis Title: Effect of Vermicompost Priming on Seed Viability and Vigor, and Plant Growth of Expired Composite Maize Varieties

Name : Theodore Hesed Roger

Student Number : A2401211127

Approved by

Supervisor:

Prof. Dr. Ir. Satriyas Ilyas, M.S.

Known by

Head of Department:

Dr. Arya Widura Ritonga, S.P., M.Si.

NIP 198712262015041001

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May this scientific work be beneficial to those in need and for the advancement of science.

Bogor, March 2026

Theodore Hesed Roger
A2401211127

CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS