



# **DETECTION OF MAJOR VIRUSES IN SHALLOT** (Allium ascalonicum) BULBS COLLECTED FROM **DIFFERENT STORAGE CONDITIONS**

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## **ABSTRAK**

ANNISA PUSPADINI SUBAGYO. Deteksi Virus-Virus Utama pada Umbi Bawang Merah (Allium ascalonicum) yang Dikoleksi dari Kondisi Penyimpanan yang Berbeda. Dibimbing oleh SRI HENDRASTUTI HIDAYAT.

Penyakit yang disebabkan oleh virus, terutama dari genus Potyvirus dan Carlavirus dilaporkan menyebabkan permasalahan pada budi daya bawang merah. Sebagian besar petani di Indonesia menggunakan umbi dari musim tanam sebelumnya sebagai perbanyakan vegetatif untuk digunakan pada musim tanam selanjutnya. Bibit umbi yang digunakan di Indonesia disimpan pada beragam kondisi penyimpanan. Penelitian dilakukan untuk mendeteksi virus-virus utama bawang merah pada beberapa kondisi penyimpanan bibit umbi dan menentukan dampak infeksi virus terhadap pertumbuhan tanaman dan hasil panen. Penelitian ini terdiri atas 4 kegiatan: (1) survei lapang dan koleksi umbi; (2) deteksi virus dari umbi; (3) deteksi virus dengan metode dot immuno binding assay (DIBA); dan (4) percobaan lapang untuk mengetahui dampak virus terhadap pertumbuhan tanaman dan hasil panen. Dua kelompok virus dideteksi, yaitu Carlavirus dan Potyvirus. Kejadian penyakit GCLV, SLV, dan OYDV di percoban lapang sangat tinggi (100%) dan infeksi campuran umum dijumpai. Kondisi penyimpanan dan umur bibit tidak memengaruhi kejadian penyakit, akan tetapi keduanya memengaruhi jumlah rumpun. Umur bibit secara tunggal memengaruhi berat umbi yang dihasilkan. Bibit yang disimpan di gudang asap selama 3 bulan (K2U3) menghasilkan rataan jumlah rumpun terbanyak, sedangkan bibit yang disimpan di luar ruangan yang ditutupi terpal selama 2 bulan (K3U2) memproduksi umbi dengan rataan berat terbesar. Bibit yang disimpan selama 3 bulan (U3) menghasilkan jumlah rumpun yang lebih banyak dan umbi yang lebih berat dibandingkan dengan bibit yang disimpan pada jangka waktu yang lebih singkat.

Kata kunci: Carlavirus, DIBA, perbanyakan vegetatif, Potyvirus.





## **ABSTRACT**

ANNISA PUSPADINI SUBAGYO. Detection of Major Viruses in Shallot (Allium ascalonicum) Bulbs Collected from Different Storage Conditions. Supervised by SRI HENDRASTUTI HIDAYAT.

Viral diseases, especially from the genus Potyvirus and Carlavirus, were reported causing problems in shallot production. Most of shallot's farmers in Indonesia use bulbs from the previous planting season as vegetative propagation for the following planting season which is very prone to virus infestation. Bulbs are stored in various storage conditions in Indonesia. The research was conducted to detect major shallot viruses in several bulb storage conditions and to determine the effect of virus infection to the plant's growth and yield. Research was consisted of four activities: (1) field survey and bulb collection; (2) detection of viruses from bulb; (3) virus detection by dot immuno binding assay (DIBA); and (4) field experiment to determine the effect of virus infection on plant's growth and yield. Two virus groups were detected, i.e. Carlavirus and Potyvirus. Incidence of GCLV, SLV, and OYDV infection in the field was very high (100%) and mix infection was very common. Storage conditions and age of bulbs together did not affect virus incidence but they affected number of tillers. Age of bulbs alone affected weight per bulb. Bulbs from indoor storage without smoke treatment stored for 3 months (K2U3) produced the highest number of tillers, whereas bulbs from outdoor storage covered by plastic stored for 2 months (K3U2) produced the heaviest average of bulbs weight. Bulbs which were stored for three months (U3) produced higher number of tillers and heavier bulb weight than bulbs from other storage periods.

Key words: Carlavirus, DIBA, Potyvirus, vegetative propagation







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Undergraduate thesis in partial fulfillment of the requirements for the degree of Bachelor of Agriculture at the Departement of Plant Protection

**DEPARTEMENT OF PLANT PROTECTION FACULTY OF AGRICULTURE BOGOR AGRICULTURAL UNIVERSITY BOGOR** 2015







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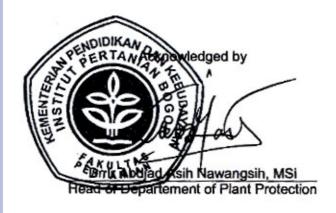
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# IPB University

## **PREFACE**

My eternal gratitude goes to Allah SWT who had given me strength during working this research entitled "Detection of Major Viruses in Shallot (*Allium ascalonicum*) Bulbs Collected from Different Storage Conditions" as requirement to be bachelor of Agriculture. It was conducted from November 2014 to June 2015 at Cikabayan screenhouse, Cianjur field, and laboratory of Plant Virology.

I am grateful to Prof Sri Hendrastuti Hidayat as my research supervisor for critically reviewing, giving direction and suggestion during my work, and also motivating me. I am very thankful to Dr Dadan Hindayana for his suggestion during undergraduate thesis defense and Dr Kikin Hamzah Mutaqin for his correction. I also thank to Dr Hermanu Triwidodo as my academic supervisor and Dr Yayi Munara Kusuma who had informed suitable field experiment location for this research.

This research was supported and funded by ACIAR project: *Increasing Productivity of Allium and Solanaceous Vegetable Crops in Indonesia and Sub-Tropical Australia*. I would like to express my thankfulness to Dr. Stephen Harper, Department of Agriculture, Forestry and Fisheries (DAFF) Queensland – Australia, for his suggestion and mind-blowing question which are really priceless.

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I hope this research can be basic information to give better understanding on the role of virus infection and storage condition on seed bulb quality.

Bogor, September 2015

Annisa Puspadini Subagyo







IPB University

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