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THE 10TH INTERNATIONAL CONFERENCE ON BIOSCIENCE AND BIOTECHNOLOGY

"RESEARCH, EDUCATIONAL SYSTEM AND MANAGEMENT OF BIOSCIENCE AND BIOTECHNOLOGY TOWARD THE INDUSTRIAL REVOLUTION 4.0"

BOOK OF ABSTRACTS

ORGANIZED BY
AGRICULTURE FACULTY OF UDAYANA UNIVERSITY

THE 10TH INTERNATIONAL CONFERENCE ON BIOSCIENCE AND BIOTECHNOLOGY

"Research, Educational System and Management of Bioscience and Biotechnology Toward The Industrial Revolution 4.0"

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Book of Abstracts

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The Effect Of Biological Fertilizer To Reduce Moler Disease And Improving Shallot Growth

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ABSTRACT

Cultivation of shallot has many pests and diseases, but until now there is no effective controlling of shallot pests and diseases except using chemical pesticides. The chemical are the most effective control pest and disease but often using chemical pesticides make pests and pathogens more resistant and also ineffective because of pests are in the shallot stem or pathogens that cause moler are in the bulbs. In connection with this issue, the application of biological fertilizers is taken to reduce the use of chemical fertilizers and pesticides. The purpose of this study was to determine the intensity of moler disease due to the influence of the application of *Pseudomonas fluorescens* and *Paenibacillus polymyxa* which are biological fertilizers and at the same time act as antagonistic agents for the cause of shallot moler.

Keywords: Moler, Paenibacillus polymyxa, Pseudomonas fluorescens, Shallot

THE EFFECT OF BIOLOGICAL FERTILIZER TO REDUCE MOLER DISEASE AND IMPROVING SHALLOT GROWTH

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ABSTRACT

Cultivation of shallot has many pests and diseases, but until now there is no the effective handling of shallot pests and diseases. The use of chemical pesticides are the most effective but the higher the use of chemical pesticides make pests and pathogens more resistant and ineffective because of which pests are in the shallot stem or pathogens that cause moler are in the bulbs. In connection with this issue, the application of biological fertilizers is taken to reduce the use of chemical fertilizers and pesticides. The purpose of this study was to determine the intensity of moler disease due to the influence of the application of *Pseudomonas fluorescens* and *Paenibacillus polymyxa* which are biological fertilizers and at the same time act as antagonistic agents for the cause of shallot moler.

Keywords: Moler, *Paenibacillus polymyxa*, *Pseudomonas fluorescens*, Shallot

INTRODUCTION

Shallots are indicated as one of the commodities that can trigger price inflation due to the instability of supply of these commodities, especially in the rainy season. To respond to this, the Agricultural Research and Development Agency (Balitbangtan) tasked with implementing a special effort program (UPSUS) shallot development related to technological innovation. Four efforts to counter the shortage of shallots in Indonesia are planting shallot outside the season (off season), optimizing the use of Indonesia's diversity ecosystems, providing seed independently, and handling postharvest appropriately (providing storage warehouses in production centers).

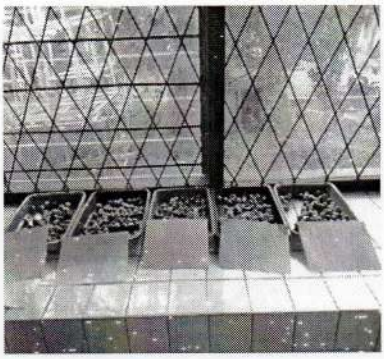
The emergence of the off-season shallot phenomenon is related to the scarcity of shallot production during the rainy season (October / December to March / April) produced by the production centers in Java such as Cirebon, Brebes, Tegal, and Nganjuk. The off-season shallot planting area in the main production center area is less than 30% of the crop in the dry season (in-season) with poor quality characteristics of shallot yield, small tuber size, pale color and less aromatic.

Off-season shallots have come to the attention of the government in developing new shallot centers in dry land, such as Lampung since 2014 began to develop shallot cultivation in four

districts namely in South Lampung Regency, Tanggamus Regency, Central Lampung Regency and Pesawaran Regency, with production of only 6,324 quintals with 102 ha harvest area and 6,2 productivity ton / ha. For this reason cultivation technology in Lampung needs to be developed extensively.

MATERIALS AND METHODS

Bima shallot cultivation is carried out in Negeri Sakti, Gedong Tataan District, Pesawaran Regency. Soil analysis in shallot cultivation showed N-Total content of 0,146 (low); P-available 9,61 ppm (medium); K-dd 11,33 mg / 100g (low); Iron (Fe) 6,92 ppm (low); calcium (Ca) 1,54 mg / 100g (low), and Al-dd 4,53 mg / 100g (low).



Planting of shallots of the Bima variety was carried out in Negeri Sakti, Gedong Tataan District, Pesawaran Regency on ultisol land of onion planting which showed an N-Total content of 0.146 (low); P-Available 9.61 ppm (medium); K-dd 11.33 mg / 100g (low); Iron (Fe) 6.92 ppm (low); calcium (Ca) 1.54 mg / 100g (low), and Al-dd 4.53 mg / 100g (low).

Application of organic matter as a base fertilizer was applied one month before planting onion bulbs. The treatment of organic material in the form of B0 without organic matter, B1 organic material from cow dung, B2 organic material from baglog oyster mushrooms, B3 organic material from chicken manure, and B4 organic material from straw compost with 20 tons / ha each.

The application of liquid biofertilizers in the form of a mixture of Pseudomonas fluorescens and Paenibacillus polymyxa, each with a density of 107 cfu / ml with a concentration of 2 ml / 1 each plot with 2 different types of implementation, namely P0, the absence of application of liquid biological fertilizer as a support for the growth of shallots and P1 is the application of liquid biofertilizers by spraying onion plants at the age of 7 DAP, 14 DAP, and 21 DAP. Each treatment was carried out in 3 replications. The severity of moler disease is calculated by scoring moler disease in the following formula:

$$DS = (\llbracket (n \; x \; z) \rrbracket \;) \; / \; (N \; x \; Z) \; X \; 100\%,$$

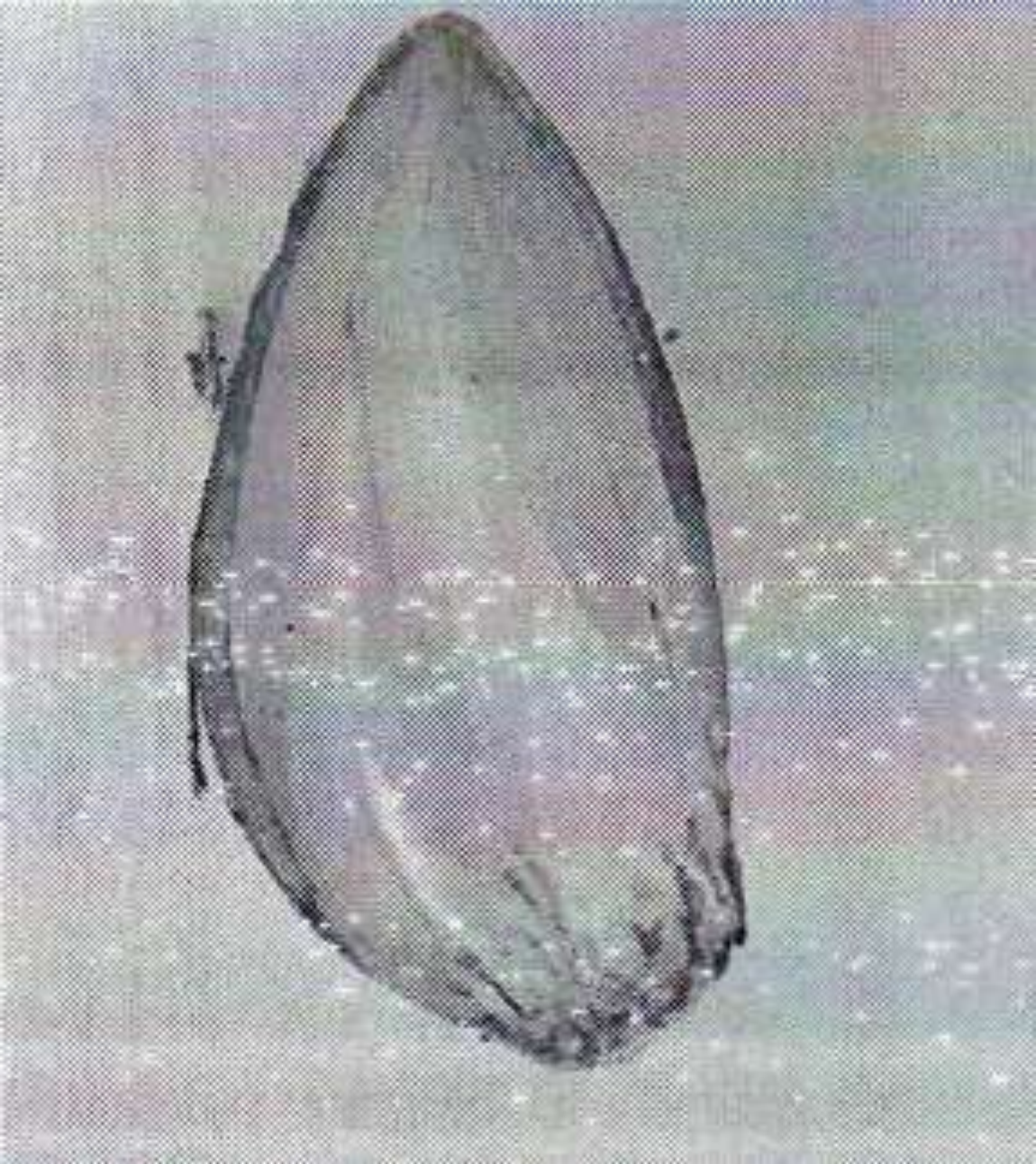
Note: DS = Disease severity (%)
n = Number of withered shallot with a certain score
z = Score on each observed shallot clump
N = Number of total shallot clumps per treatment
Z = The highest score

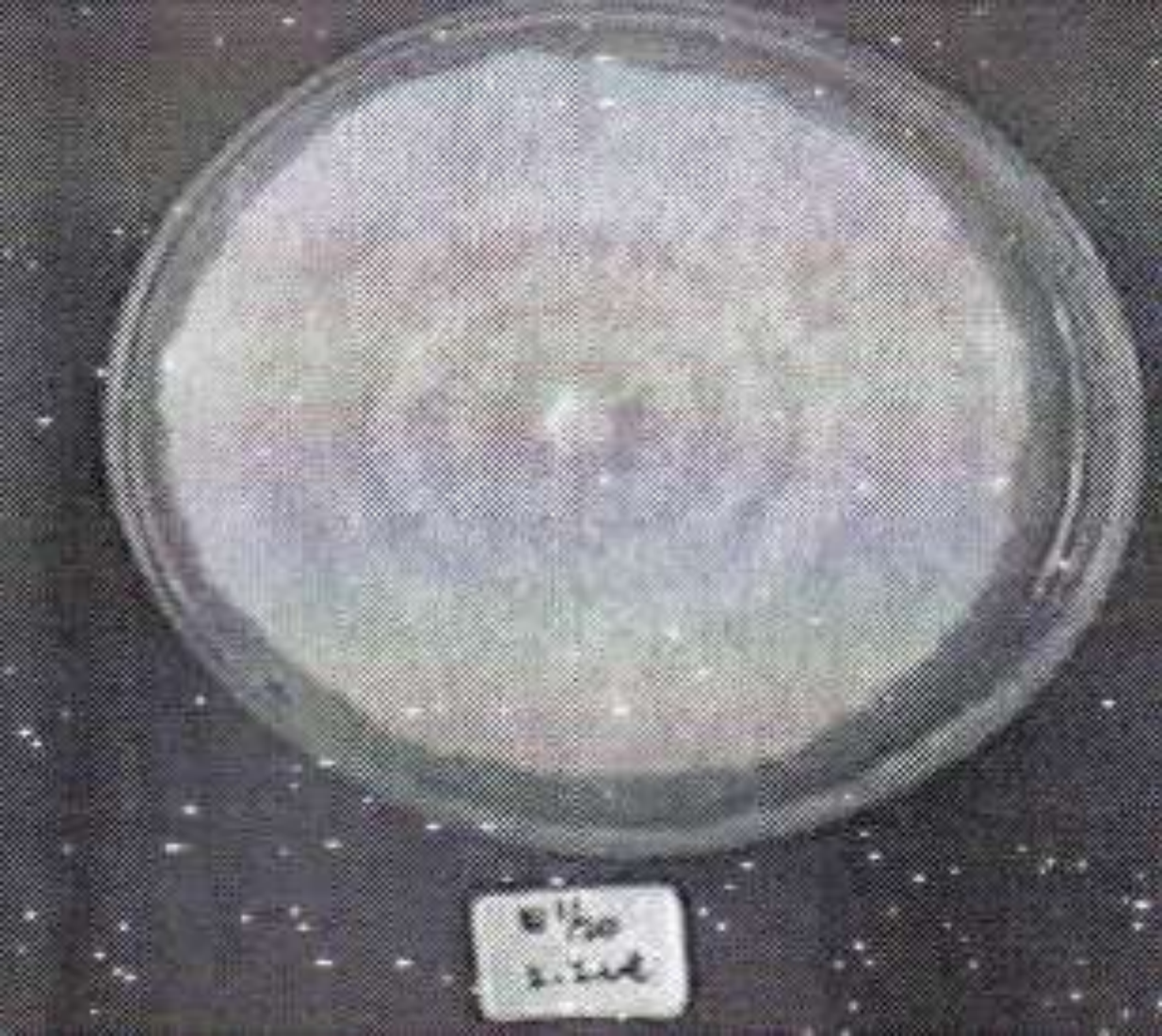
The study was conducted from September to December 2018.

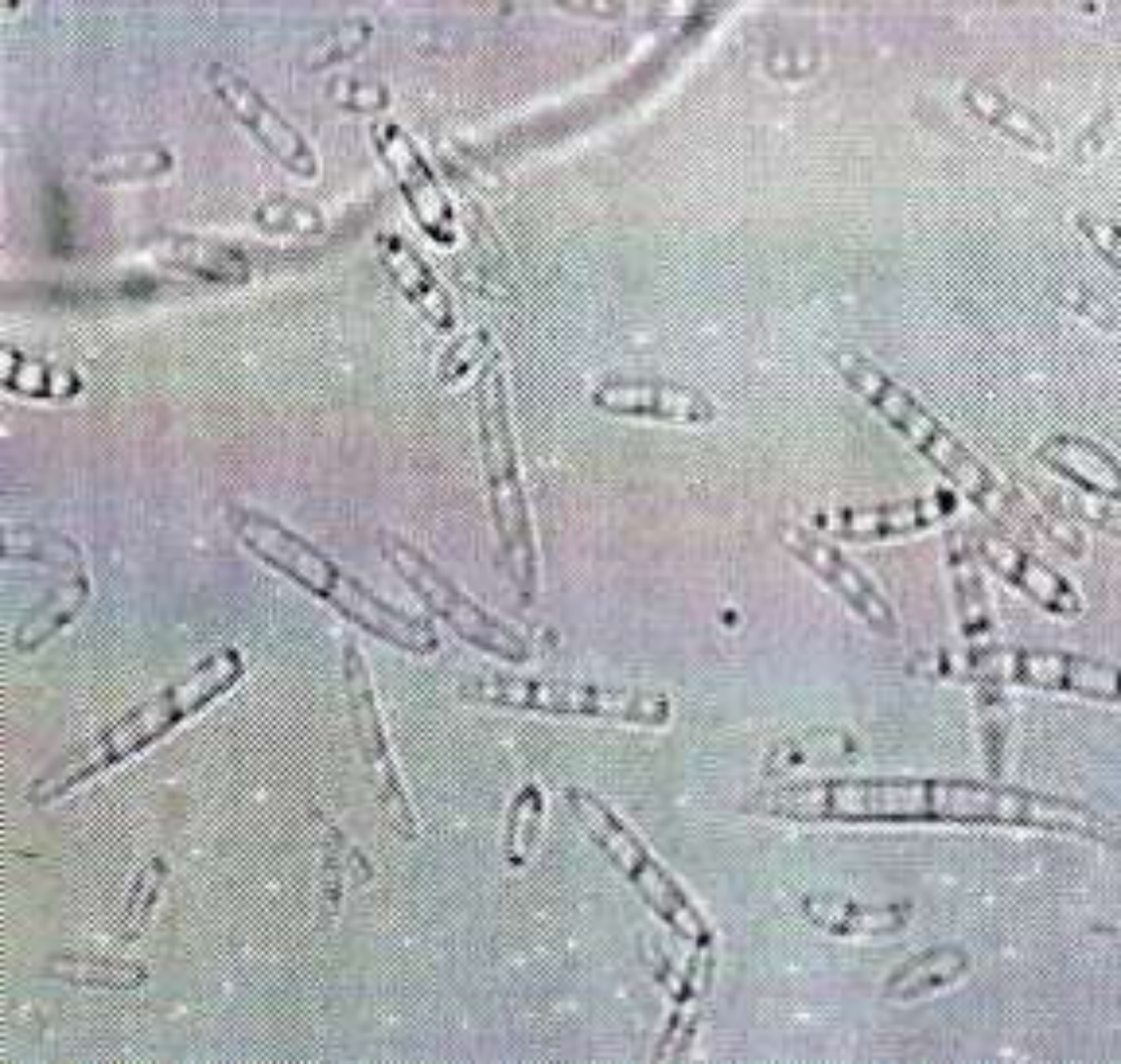
RESULTS AND DISCUSSION

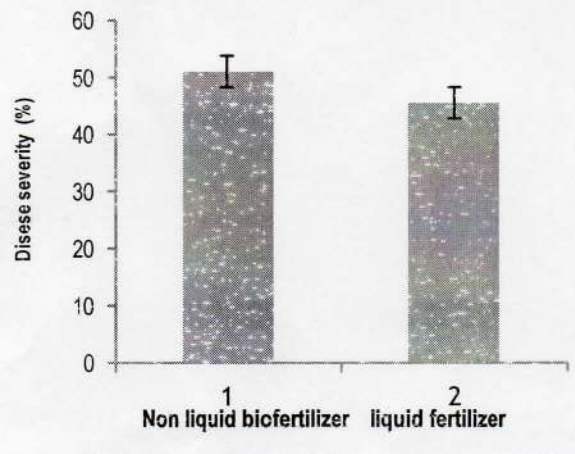
The incidence of moler disease seen since the plants aged 21 DAP to 49 DAP.

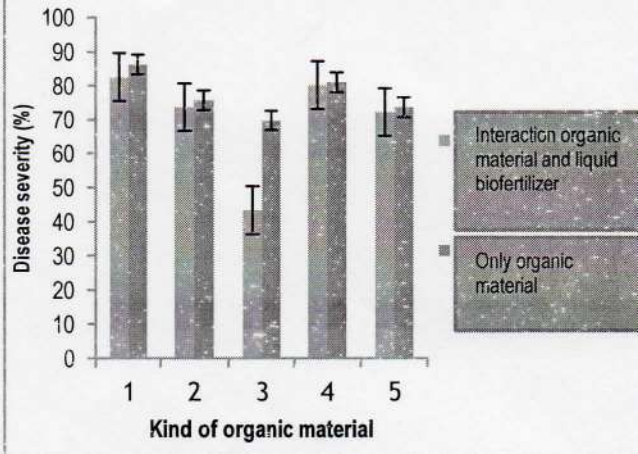
Moler disease is more common in the rainy season. This picture in below show the symtoms of moler disease and the fungy cause moler disease.








Disese severity (%)
60
50
40
30
20
10
0
1
Non liquid biofertilizer
2
liquid fertilizer


Disease severity (%)
100
90
80
70
60
50
40
30
20
10
0
1
2
3
4
5
Kind of organic material
Interaction organic material and liquid biofertilizer
Only organic material

The number of shallot bulbs produced per plot experiment

Treatment	The Number of bulbs/ m^2
No organic material and no liquid biofertilizer	66,50 d
Cow manure and no liquid biofertilizer	214,33 ab
Oyster mushroom baglog and no liquid biofertilizer	246,70 a
Chicken manure and no liquid biofertilizer	103,67 c
Straw compost and no liquid biofertilizer	216, 67 ab
No organic material but only liquid biofertilizer	107,33 c
Cow manure and liquid biofertilizer	175,00 b
Oyster mushroom baglog and liquid biofertilizer	242,00 a
Chicken manure and liquid biofertilizer	140,00 bc
Straw compost and liquid biofertilizer	219,67 ab

CONCLUSION

1. Provision of organic material in the form of mushrooms 20 tons / ha with or without liquid biological fertilizer reduces the incidence and severity of moler disease

2. Giving organic material in the form of mushroom baglok 20 tons / ha with or without liquid biological fertilizer increases the weight of onion tubers, increases the number of tubers and reduces the weight of rotten tubers.

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Certificate

of Attendance and Participation Awarded to

Suskandini Ratih Dirmawati

as

Poster Presenter

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Dean of Faculty of Agriculture
Udayana University

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Committee

Dr. I Made Sukewijaya, S.P., M.Sc.