

# EFFECT OF BIOCYCLIC HUMUS SOIL ON YIELD AND QUALITY PARAMETERS OF PROCESSING TOMATO (*Lycopersicon esculentum* Mill.)

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17<sup>th</sup> INTERNATIONAL  
SYMPOSIUM  
PROSPECTS FOR  
THE 3<sup>rd</sup> MILLENNIUM  
AGRICULTURE



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AGRICULTURAL UNIVERSITY OF ATHENS

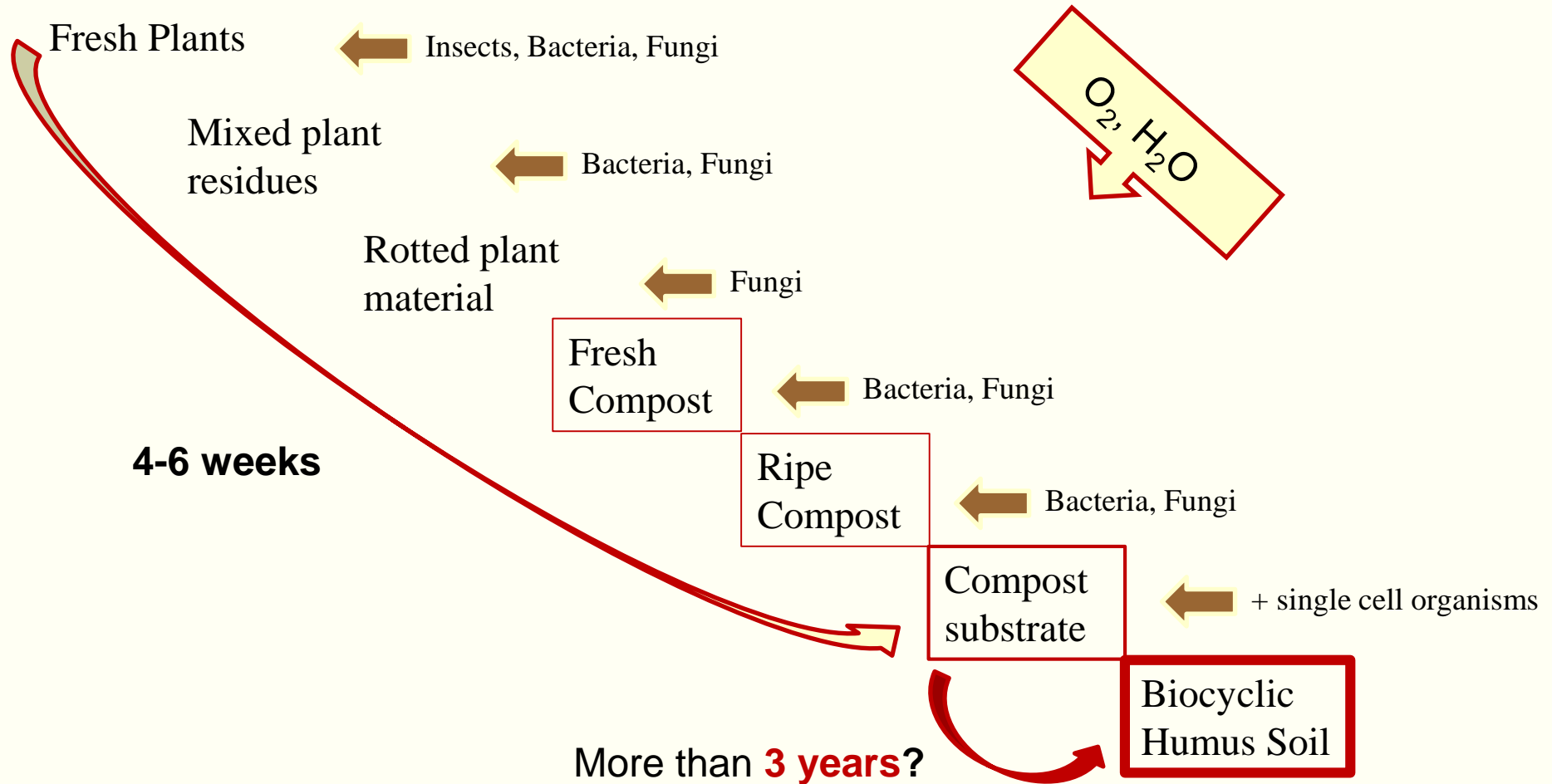
# *Preview:*

- 1) What is **Humus Soil**
- 2) Why **Processing tomato**
- 3) The **Experiment**
- 4) **Results & Discussion**
- 5) **Conclusion**



# 1) What is Humus Soil?

## From Fresh Compost to Biocyclic Humus Soil



# 1) What is Humus Soil?

## Characteristics of Biocyclic Humus Soil

- Cation Exchange Capacity: 91,9 meq Na/100g
- High nutrient content:
  - ❖  $N \simeq 3\%$
  - ❖  $P_2O_5 \simeq 1\%$
  - ❖  $K \simeq 1\%$

Extraction test:  
 $N, P_2O_5, K \simeq 0$

- **Bound Nutrients**
- but accessible for the **plant roots**

**No more water** soluble nutrients

**Fertilization effect**

Without the **negative** effects of chemical fertilizers or half ripe composts



## 1) What is Humus Soil?

# Biocyclic Vegan Standard

**Global approved stand alone standard of IFOAM**

(International Federation of Organic Agriculture Movements) 11/2017

- Closing nutrient cycles locally and globally
- Promoting biodiversity & soil fertility



- First Organic Standard without animal inputs
- 100% plant based inputs
- Environmental & health benefits

A “new” Organic Standard with “old” roots from the German pioneer of organic farming Adolf Hoops (1932-1999)

Developed in **Greece** over the last 20 years



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# That's Organic - Worldwide.

Approved in 2017 on the basis of an equivalence assessment against the COROS. Assessment summary available on click.



## GLOBAL



### IFOAM Standard

International Standard for Forest Garden Products (FGP)

Biocyclic-Vegan Standard



## AFRICA

Tunisia Organic Regulation

East African Organic Products Standard

The SAOSO Standard, South Africa

Zimbabwe Standard for Organic Farming, Zimbabwe



## ASIA

Asian Regional Organic Standard



Saudi Arabia Organic Regulation

China Organic Regulation

India Organic Regulation

Israel Organic Regulation

Japan Organic Regulation

Korea Organic Regulation

Diaoyutai Private Organic Standard, China

OFDC Organic Certification Standard, China

Sunshine Earth Organic Standard, China

HKORC Organic Standard, Hong Kong

Biocert International Standards, India

Japan Organic & Natural Foods Association Organic Standard, Japan

MASIPAG Organic Standards, The Philippines

DCOK, LLC International Standards, South Korea

ACT Basic Standard, Thailand

Vietnam PGS Standards, Vietnam



## OCEANIA



National Standard for Organic and Bio-Dynamic Produce, Australia

New Zealand Organic Export Regulation

Pacific Organic Standard, Pacific Community

Australian Certified Organic Standard, Australia

NASAA Organic Standard, Australia



## EUROPE

AsureQuality Organic Standard, New Zealand

EU Organic Regulation

Switzerland Organic Regulation

Turkey Organic Regulation



Bio Suisse Standards, Switzerland

Nature & Progrès Standards, France

The EcoWellness Standard, Germany

CCPB Global Standard, Italy

Krav Standards, Sweden



## THE AMERICAS

Argentina Organic Regulation

Canada Organic Regulation

Costa Rica Organic Regulation

Ecuador Organic Regulation

USA Organic Regulation

Argencert Organic Standard, Argentina

OIA Organic Standards, Argentina

Bolicert Private Standards, Bolivia

IBD Organic Guidelines, Brazil

CCOF International Standard, USA

## THE FAMILY OF STANDARDS

contains all standards officially endorsed as organic by the Organic Movement, based on their equivalence with the Common Objectives and Requirements of Organic Standards. Both private standards and government regulations are admissible.

[www.ifoam.bio/ogs](http://www.ifoam.bio/ogs)

## 2) Why Processing tomato

*Lycopersicon esculentum* Mill

37.797.000 tonnes worldwide (2017)

420.000 tonnes Greece (2017)

- Very important for the food industry

Cultivation conditions

- ☐ High nutrient uptake
- ☐ Intense irrigation

- ❖ Interest in Organic cultivation
- ❖ **Greece** very few organic processing tomato producers
- ❖ Continuous research from 2014 at the Agricultural University of Athens



### 3) The Experiment

#### Planting Material:



Young processing  
tomato seedlings  
**Heinz 3402**



Transplanting of  
seedlings into the  
final field position





### 3) The Experiment

#### Treatments:

#### 1) Biocyclic Humus Soil (8 l/plant)

4 years old Biocyclic Humus Soil

- ❖ Olive pomace
- ❖ Grape pomace
- ❖ Olive leaves



#### 2) Inorganic fertilizer (200 kg/ha)

N-P-K 42-0-0



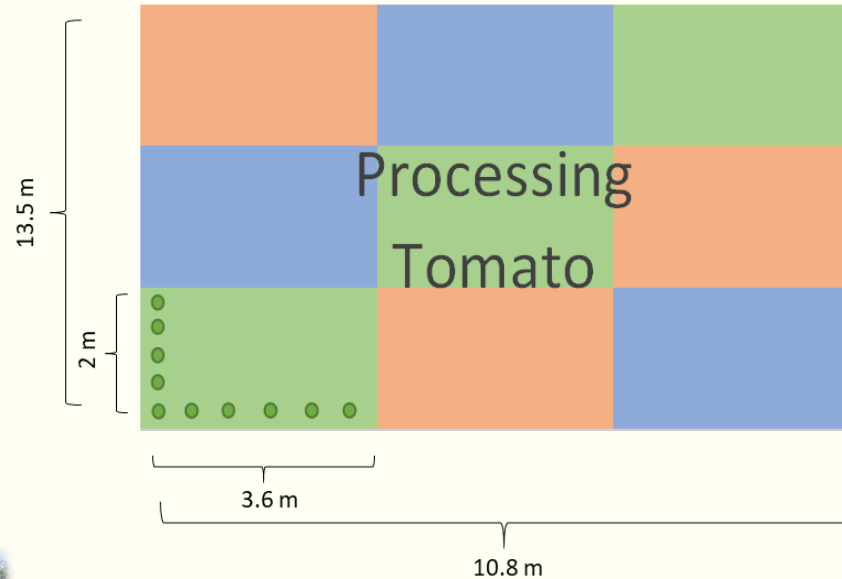
#### 3) Control




Soil Structure: Clay- Loam



### 3) The Experiment

#### Experimental field:



-  Control (Con)
-  Inorganic fertilizer (NPK)
-  Biocyclic Humus Soil (HS)

Organic experimental field  
of the Agricultural  
University of Athens



### 3) The Experiment

#### Measurements:

Harvest: 117 days



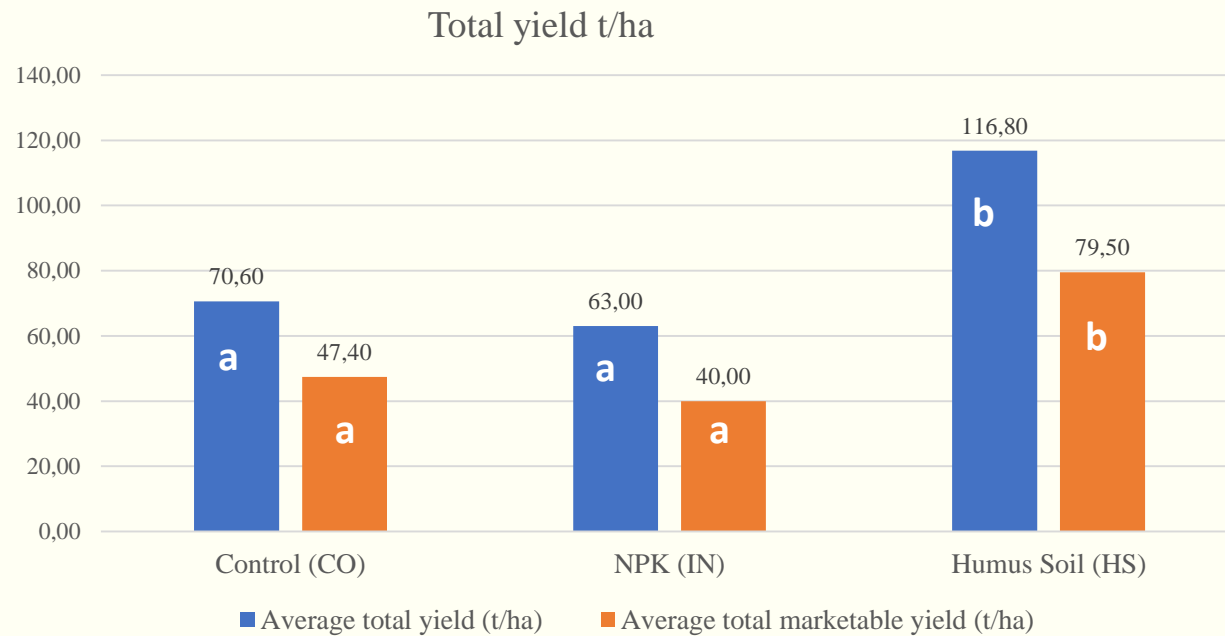
- ❖ Total yield
- ❖ Total soluble solids (°Brix)
- ❖ Total citric acid content



- ❖ Compression & Penetration tests, fruit firmness



## 4) Results & Discussion





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### Humus Soil

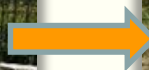


### NPK fertilizer

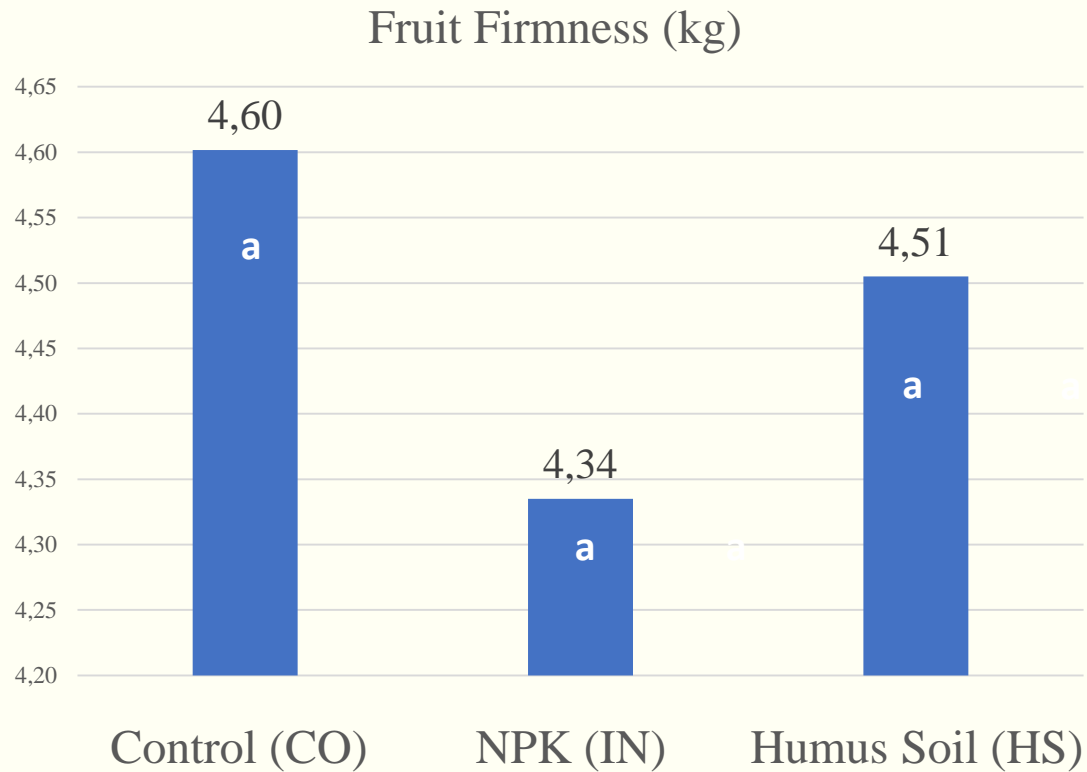




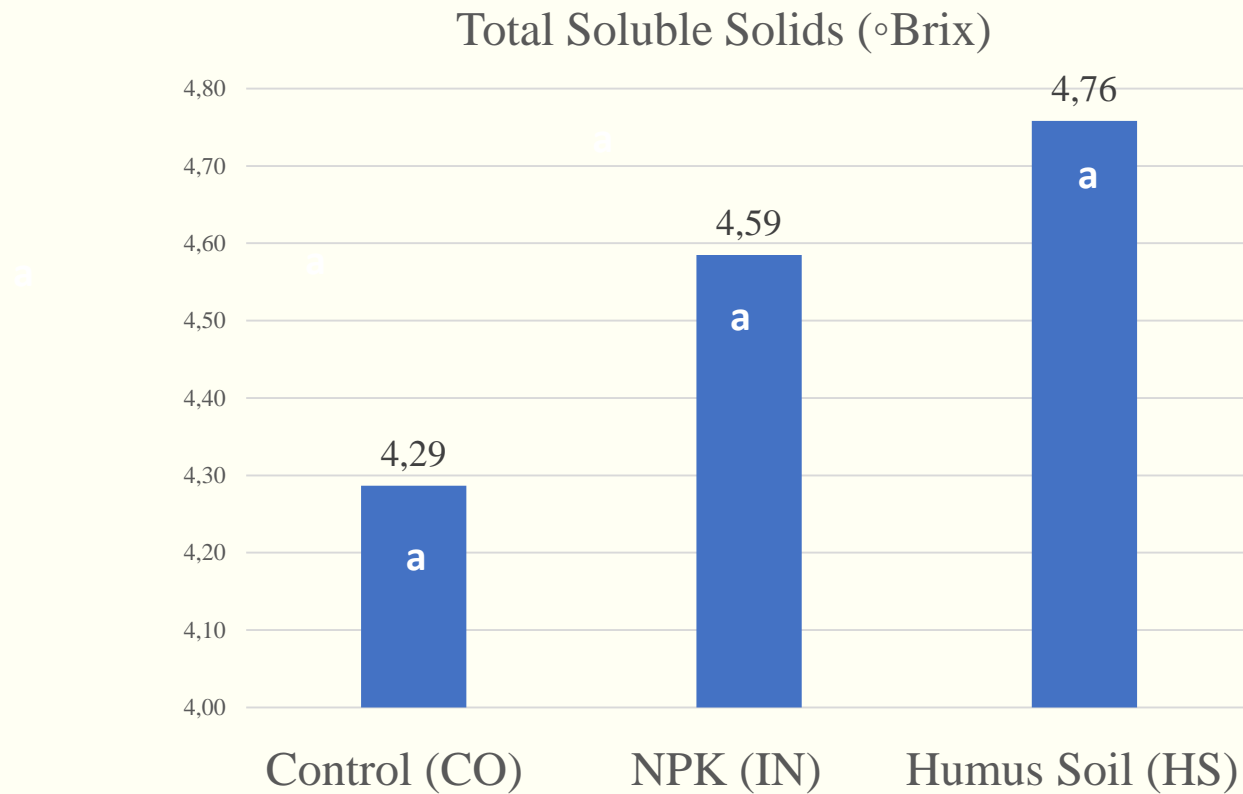
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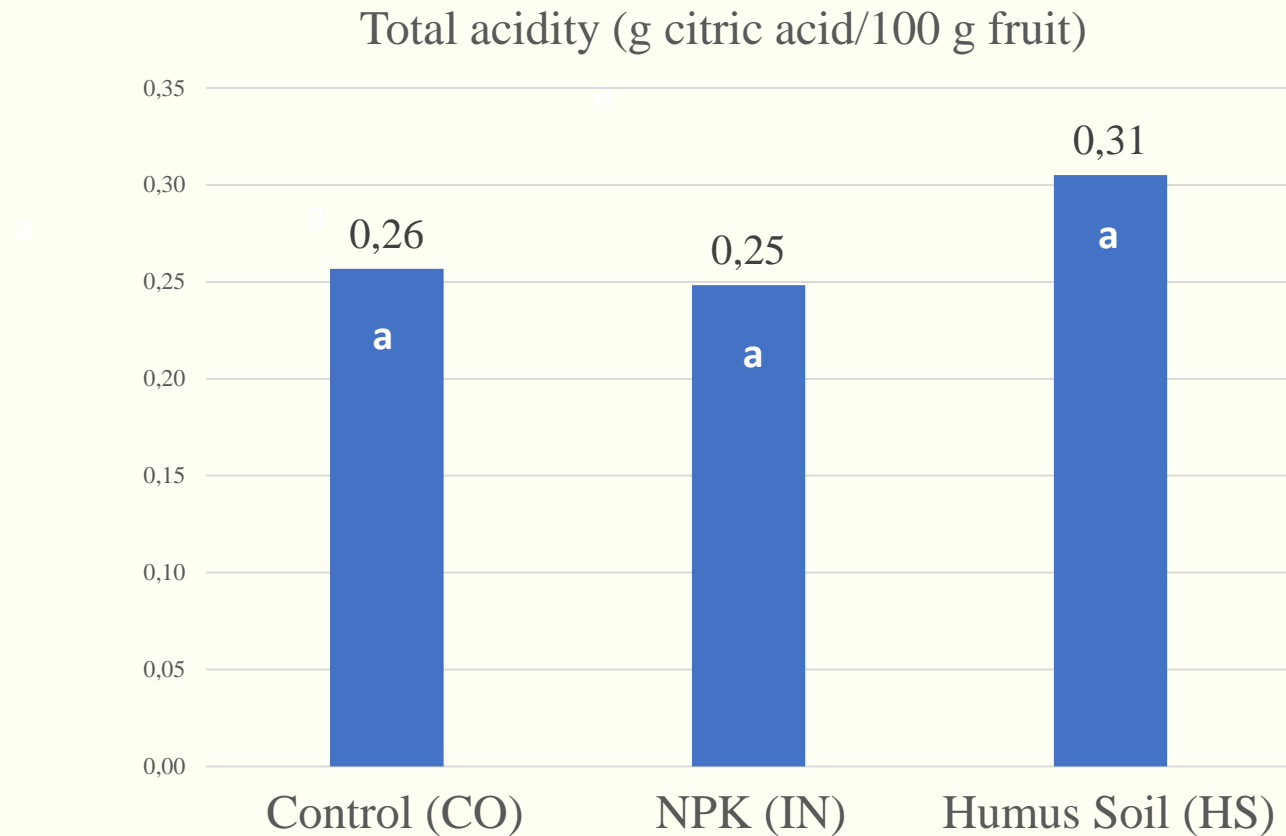


## 4) Results & Discussion





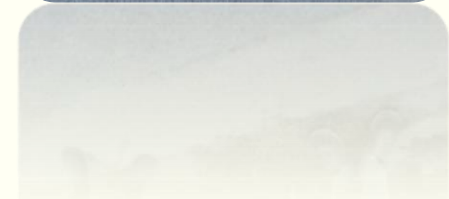
## 4) Results & Discussion



## 5) Conclusion

- ❖ Problematic soil structure / water capacity
- ❖ Using Humus Soil as a growing substrate even in inadequate soil environment
- ❖ Using the same material for many growing seasons
  - ☐ Usage of Humus Soil
  - ☐ Characterization of Humus Soil

*Thank you for your attention!*



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