EFFECT OF BIOCYCLIC HUMUS SOIL ON YIELD AND QUALITY PARAMETERS OF SWEET POTATO (*Ipomoea batatas* L.)

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The International Conference of the University of Agronomic Sciences and Veterinary Medicine of Bucharest
AGRICULTURE FOR LIFE, LIFE FOR AGRICULTURE
June 7 – 9, 2018, Bucharest, Romania

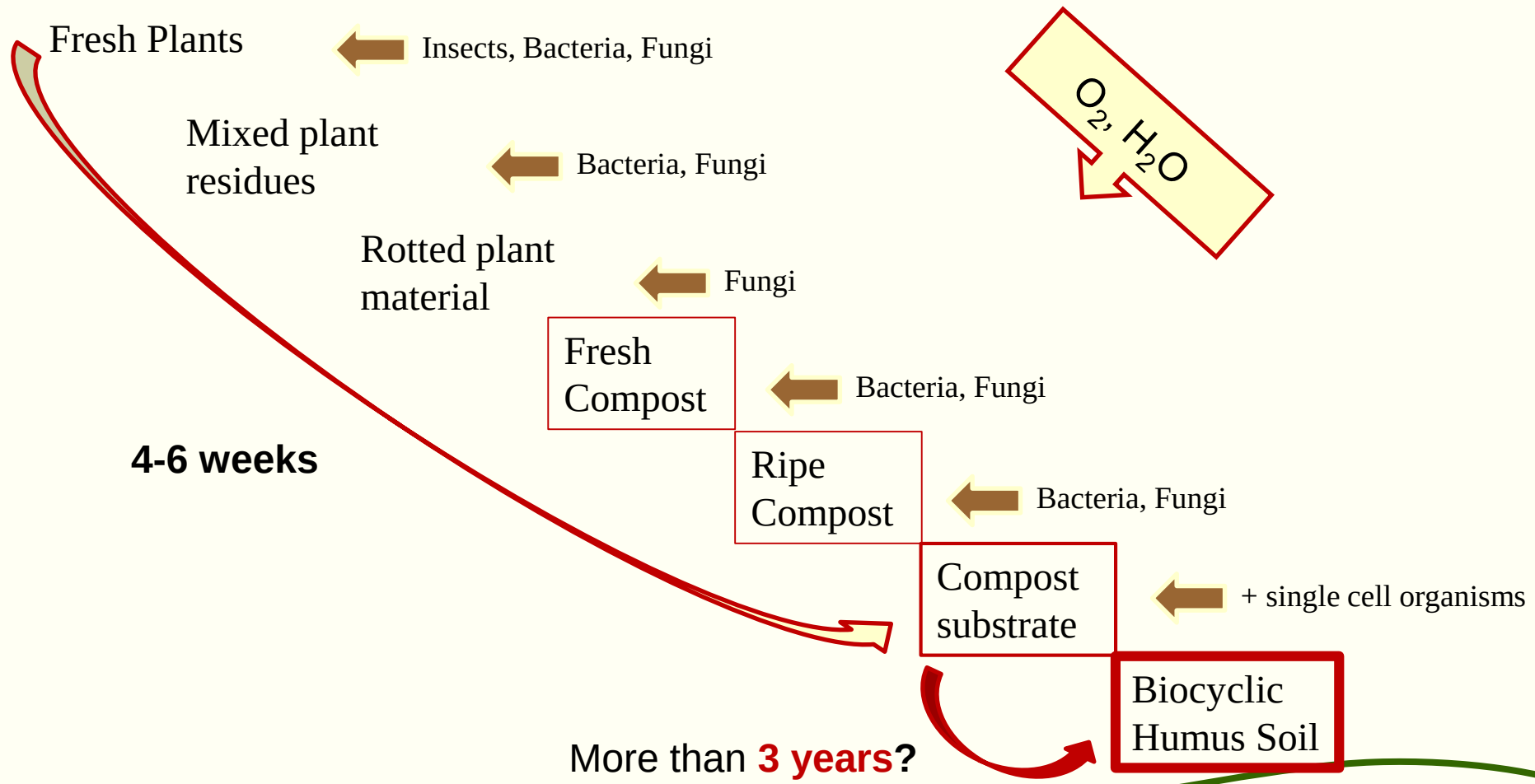
ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
AGRICULTURAL UNIVERSITY OF ATHENS

Preview:

1) What is **Humus Soil**
2) Why **Sweet Potato**
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 ≃ 3%
  - ❖ P_2O_5 ≃ 1%
  - ❖ K ≃ 1%

Extraction test:
N, P_2O_5, K ≃ **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

ORGANIC
IFOAM FAMILY of STANDARDS

That's Organic - Worldwide.

Approved in 2017 on the basis of an equivalence assesment against the COROS. Assesment 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

AsureQuality Organic Standard, New Zealand

EUROPE

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

Note: Applicant standards are marked in grey.

Family Standards Frame: January 03, 2018.

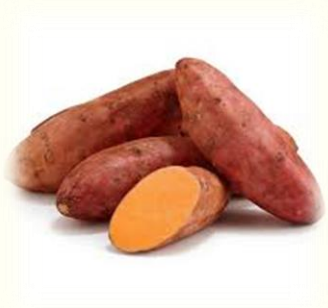
Click on each standard to see more details.

Best viewed with Adobe Reader

2) Why Sweet Potato

Ipomoea batatas (L.) Lam. Convolvulaceae

105 million tonnes worldwide
117 countries (China, U.S.A.)



Cultivation conditions

- ❑ 21-26 °C
- ❑ Sun
- ❑ sand-loam soil

- ❖ Interest in Organic cultivation
- ❖ **Greece** very few organic sweet potato producers
- ❖ **Romania** a new upcoming crop

3) The Experiment

Planting Material:

Sweet potato branches from an organic production in Crete

Preparing of sweet potato slips in Biocyclic Humus Soil

Planting of rooted slips

3) The Experiment

Treatments:

1) Biocyclic Humus Soil (15 l/plant)

4 years old Biocyclic Humus Soil

- Olive pomace
- Grape pomace
- Olive leaves

2) Inorganic fertilizer (200 kg/ha)

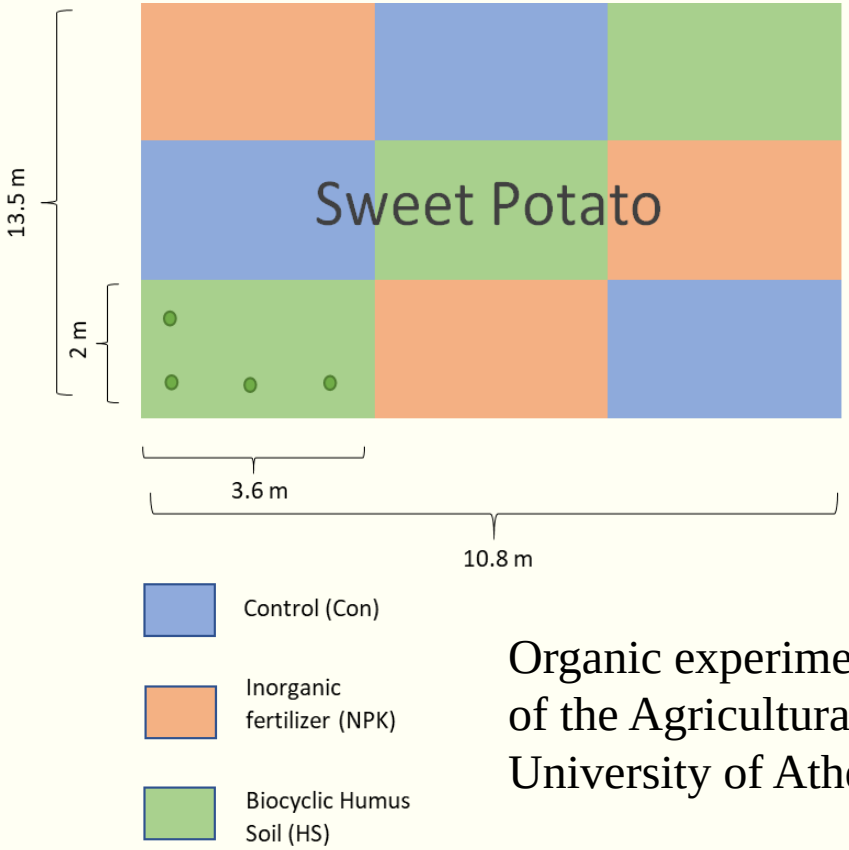
N-P-K 42-0-0

3) Control

Soil Structure: Clay- Loam

3) The Experiment

Experimental field:



Organic experimental field of the Agricultural University of Athens

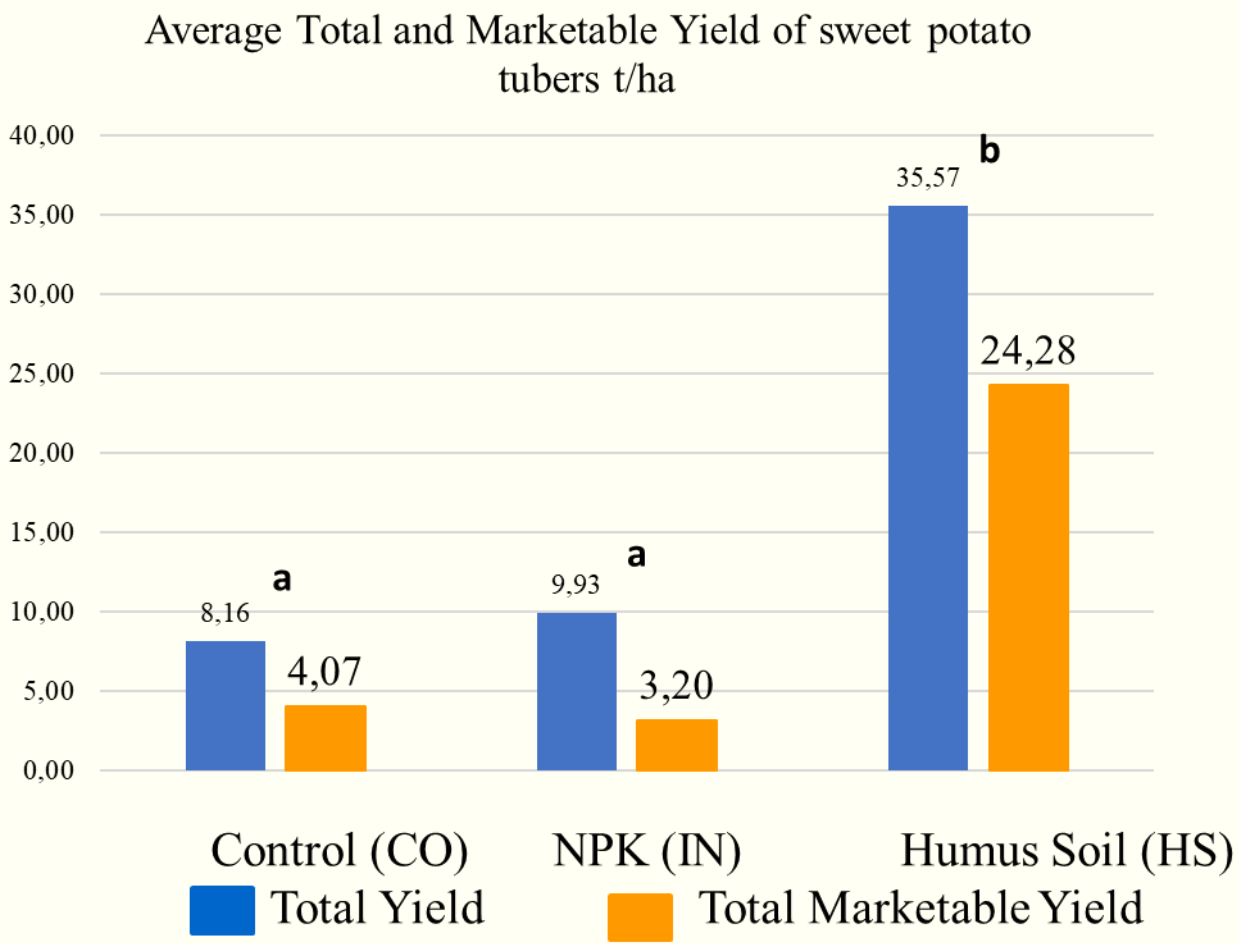
3) The Experiment

Measurements:

Harvest: 137 days
Storage: 1 month

- Vine and leaf weight
- Tubers weight
- Tuber number per plant

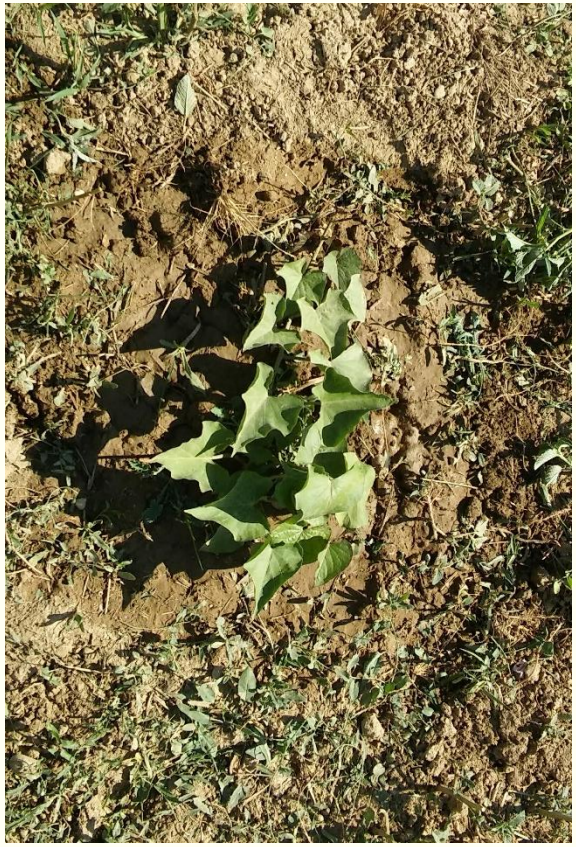
- Compression & Penetration tests (Instron Universal Testing Machine)
- N, K content (Kjeldahl,spectrometry)



World	**7,3** t/ha 2001
	13,9 t/ha 2006
U.S.A.	**18,6-35,9** t/ha 2018
Greece	**20** t/ha 2018

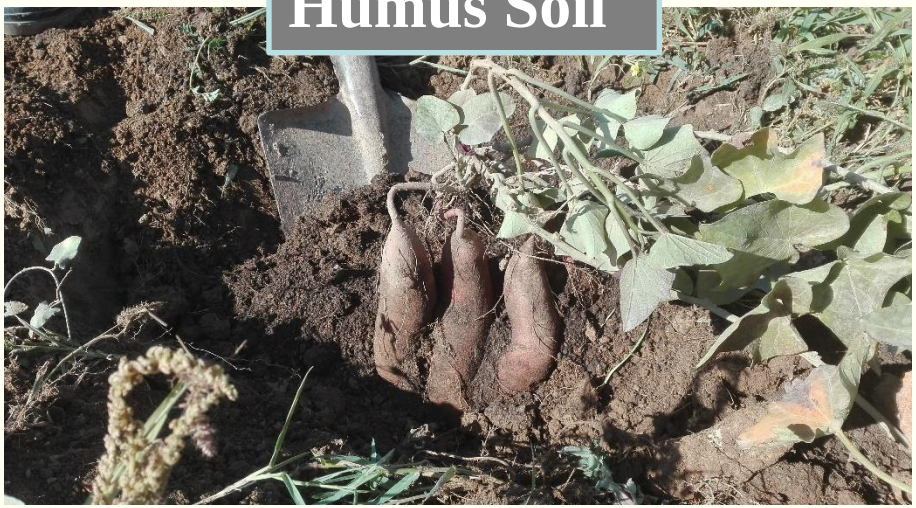
Humus Soil

NPK fertilizer



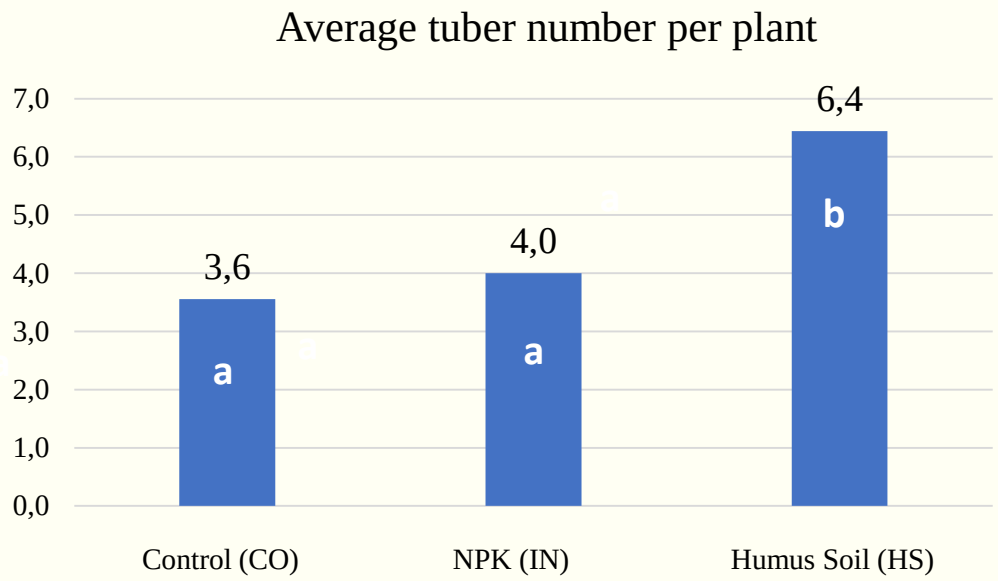
4) Results & Discussion

Humus Soil



NPK fertilizer

4) Results & Discussion



Average **marketable yield** = 5.52202 + 1.3943*(Average **total yield**) – 0.4556*(Average **tuber number** per plant)

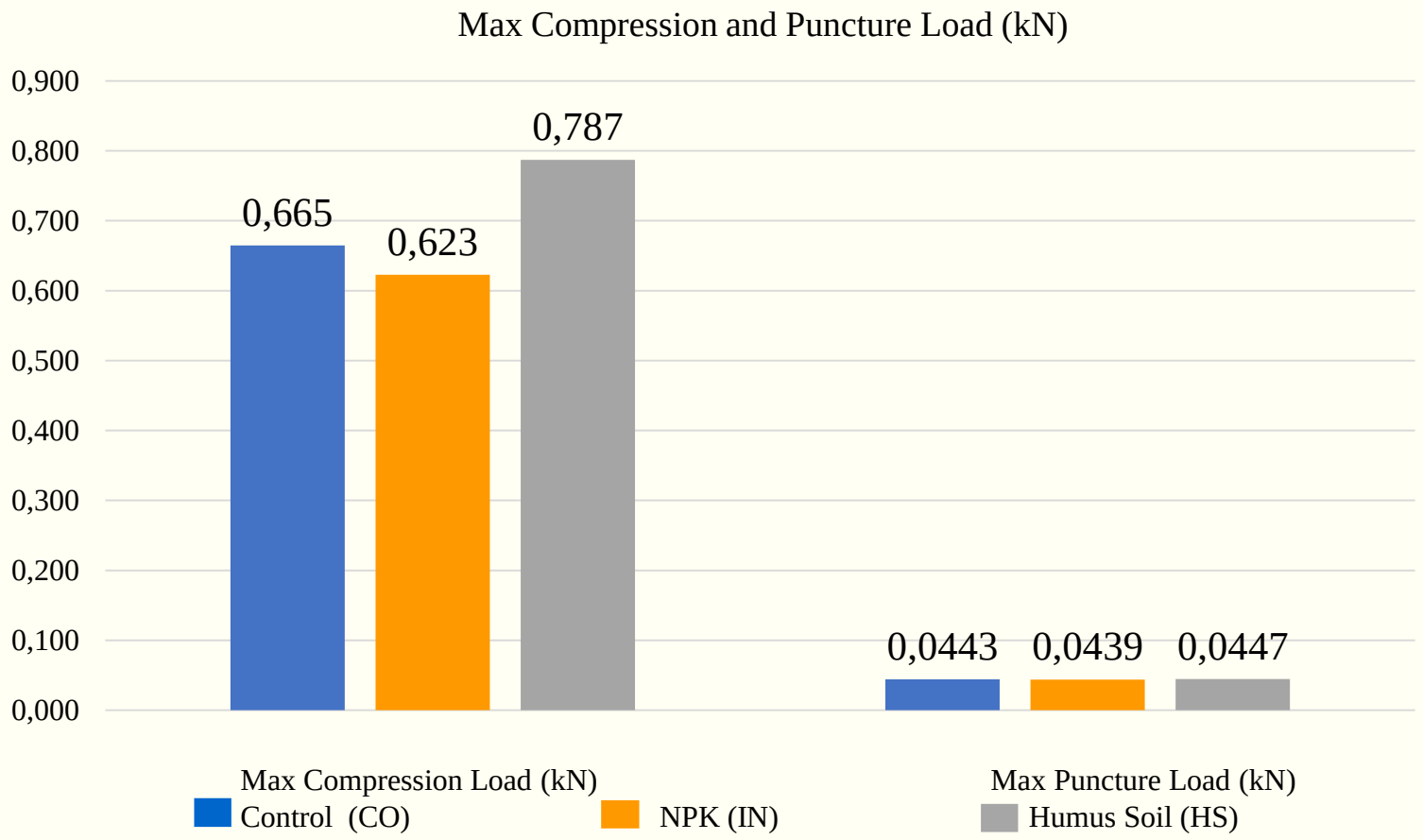
St. error:	(2,24837)	(0,10954)	(0,10954)
P(level)	(0,049)	(0,000014)	(0,005949)

Std. Error of estimate: 1,3366 F (2, 6) = 254,95

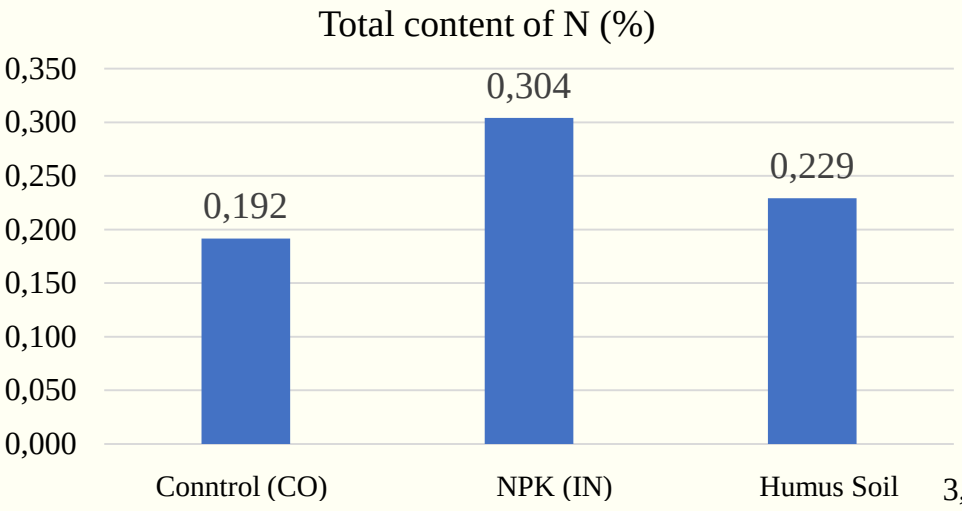
4) Results & Discussion

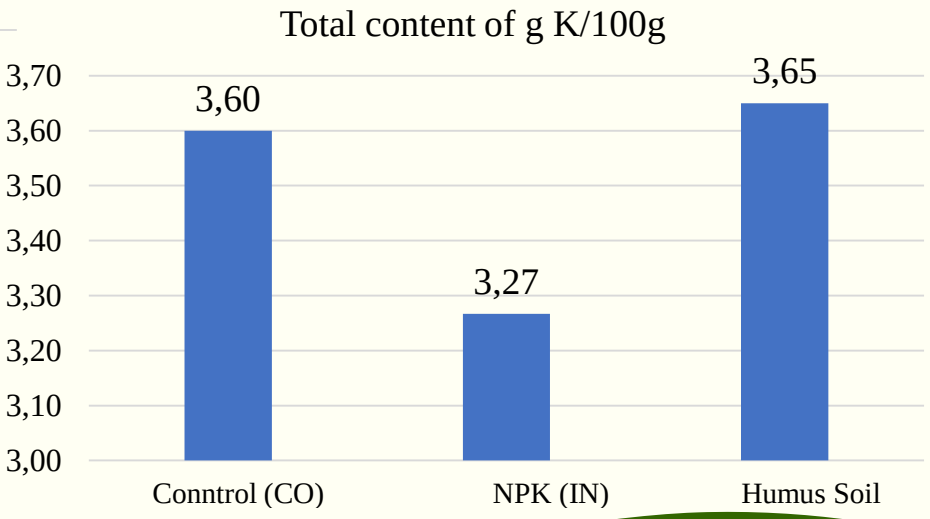
Compression test

Puncture test


Max Compression and Puncture Load (kN)
0,900
0,800
0,700
0,600
0,500
0,400
0,300
0,200
0,100
0,000
0,665
0,623
0,787
0,0443
0,0439
0,0447
Max Compression Load (kN)
Control (CO)
NPK (IN)
Max Puncture Load (kN)
Humus Soil (HS)

4) Results & Discussion





5) Conclusion

- ❖ Problematic clay-loam soil structure.
- ❖ 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!