



**A Cornell University és a
Magyar Agrár- és Élettudományi
Egyetem
közötti együttműködés jó
gyakorlatai**

Szeged, 2023. november 9.

Cornell University

Founded in 1865
with a revolutionary
commitment from Ezra
Cornell to create a
university open to all,
“where any person can
find instruction in any
study.”



Cornell's Campuses & Locations

Ithaca, New York



**Weill Cornell Medicine
New York City**



**Cornell Tech
New York City**



Doha, Qatar



Geneva, New York



16,071

—
UNDERGRADUATE
STUDENTS

10,213

—
GRADUATE AND
PROFESSIONAL STUDENTS

2,864

—
FACULTY

51

—
NOBEL LAUREATES

\$407M

—
UNDERGRADUATE GRANT
AID (FY23)



1. Jó gyakorlat - Alumni

- A Gödöllői Agrártudományi Egyetem /Szent István Egyetem /MATE - Cornell College of Agriculture and Life Sciences együttműködési megállapodás 1996 óta folyamatos, de hallgatói mobilitás alig volt
- **Alumni kapcsolat: Mark A. Sarvary**, Director of the Investigative Biology Teaching Laboratories, College of Agriculture and Life Sciences, Cornell University



Gödöllő, 1999



Cornell University, USA, 2018

Kereslet – kínálat találkozása:

- Cornell STEM (Science, Technology, Engineering and Mathematics) alapszakos hallgatóinak ritkán van lehetőségük külföldi tapasztalatszerzésre, mert nem tudnak egy egész féléves vagy éves külföldi tanulmányútra menni a szigorú tanmenet miatt.
- Szakmai gyakorlatot teljesíteniük kell
- A Cornelles alapszakos diákoknak gyakran a nyári gyakorlat az egyetlen esélyük a nemzetközi tapasztalatszerzésre
- Cornell CALS Global Fellows Programon keresztül jelentkeztek, de az ott elnyert szakmai gyakorlatos hely nem jelent garanciát a finanszírozásra, kivéve az Erasmust 😊
- Global Fellows Program megszűnik, de az Erasmus szakmai gyakorlatot a MATE-n továbbra is hirdetik a Cornelles hallgatóknak

Kereslet – kínálat találkozása:

- A MATE befogadó tanszékei két hónapos nyári gyakorlatot ajánlanak az Erasmus programban résztvevő bejövő hallgatóknak (Május végi kezdéssel)
- Két téma: Zoology in a Changing World és Conservation in Practice: Fish germ cell, cryopreservation and transplantation
- Eddig 9 Erasmus diákunk volt a Cornellről
- Az Erasmus megállapodás alapján a Cornell szintén kész fogadni a MATE hallgatóit szakmai gyakorlatra
- MATE hallgatói és oktatói számára egy mobilitás a QS Top Universities rangsor 13. egyetemén „life changing experience”
- A MATE- szakmai gyakorlatos helyeket az Erasmus KA171-es kvótáknak megfelelően hirdetjük

3. Jó gyakorlat – Szinergiák

- Cornell University-n meghirdetésre került a Danube AgriFood Joint Master (DAFM) Erasmus Mundus közös mesterképzésünk
- 2023-ban egy Cornellen végzett hallgatót fel is vett a DAFM
- Közös cikk az Erasmus szakmai gyakorlatról (készül)
- Cornellre járó magyar származású hallgató – Diaszpóra Ösztöndíj?
- Word-of-mouth
- Rendszeres poszterkiállítás a szakmai gyakorlatról, a formában a tudományos előadásokon megszokott gyakorlatot követik



The Negative Effect Of Solar Farms On Soil Mesofauna Biomass In Gödöllo, Hungary

Samuel Cavanagh sbc222@cornell.edu
Cornell CALS Global Fellows, Hungarian University of Agriculture and Life Science



Background

Solar energy is a rapidly growing industry.

- Many small commercial operations have taken advantage of the country's huge wealth of flat "barren" land.
- Farmers have started converting portions of their field into solar panel arrays.
- Little research has been done on the effect of solar panels on soil health, mainly due to interruption of manure and herbicide use to control weeds.

What is soil health?

- Measured as a combination of factors:
 - Sunlight, water runoff, and biodiversity
 - A 10-factor organisms in every grain of soil
- Soil quality will lose nutrients and decrease in microorganism diversity, requiring 10x more use when converted back to farmland.

Introduction

This poster I prepared with Dr. Zoltan Nagy and Dr. János Székely, and others in the Department of Zoology and Ecology at the Hungarian University of Agriculture and Life Sciences.

With permission from local landowners, we sampled soils from solar farms across Hungary, as well as nearby fields which acted as controls.

Our goal was to investigate the extent of biodiversity and biomass loss & decrease in free moisture in soil underneath solar panels compared to nearby soil.

Methodology

Two methods of soil sampling

- Soils were sampled at 0-10 cm (Pictures A, B, C) & 10-20 cm (Picture D) from underneath solar panels, 5 meters from between solar panels, and 5 from control sites.
- Press. Almost measurement of organisms diversity, investigation of different soil layers.
- Core. Snapshot of health at one time.
- **Soil core method (Picture 1)**
 - The legs of slightly buried underneath solar panels, between solar panels, and at control sites.
 - Weighed before placement, after 8 months, and after 12 months to detect vegetation, etc.
 - Press/Care (Picture 2) before an estimation of long-term health but careful area information regarding specific diversity of life.

Soil sample analysis

- QMS index - testing of soil at control & solar farms
- A chemical method of measuring soil health according to biodiversity, based on the weighing of an eco-indicator group from DNA by a variety of soil organisms.

Parameter	Control	Solar Panel
QMS index	0.85	0.75
Soil moisture	15%	10%
Soil temperature	15°C	18°C
Soil pH	7.5	7.5
Soil organic carbon	1.5%	1.5%
Soil nitrogen	0.1%	0.1%
Soil phosphorus	0.05%	0.05%
Soil potassium	0.02%	0.02%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%
Soil iron	0.01%	0.01%
Soil manganese	0.01%	0.01%
Soil selenium	0.01%	0.01%
Soil boron	0.01%	0.01%
Soil iodine	0.01%	0.01%
Soil bromine	0.01%	0.01%
Soil fluoride	0.01%	0.01%
Soil chloride	0.01%	0.01%
Soil sulfate	0.01%	0.01%
Soil nitrate	0.01%	0.01%
Soil phosphate	0.01%	0.01%
Soil potassium	0.01%	0.01%
Soil calcium	0.01%	0.01%
Soil magnesium	0.01%	0.01%
Soil sulfur	0.01%	0.01%
Soil zinc	0.01%	0.01%
Soil copper	0.01%	0.01%

Köszönjük a megtisztelő figyelmet!

MATE Nemzetközi Oktatási Ügyek Központ

Dr. Tarr Zsuzsanna – tarr.zsuzsanna@uni-mate.hu

Heltai Zsuzsanna – heltai.zsuzsanna@uni-mate.hu