The CONDENSE managing system for the production of novel fertilizers from OMW and manures

Project acronym : Condense

Project's coding : **LIFE10 ENV/GR/596**

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Beneficiaries

Coordinating beneficiary:

(1) Development Company of Western Greece Region SA (DCWGR)

Associated beneficiaries:

(2) Technological Education Institute of Crete (TEIC)

(3) Technical University of Crete (TUC)

(4) University of Leeds (UOL)

(5) Region of Western Greece (RWG)

The problem…

- Phosphorus and Potassium are both MINERALS - a non-renewable source - and their availability is limited in the planet
- Phosphate Rock has been included in the critical raw materials' list of the EU
- Potash (any of various mined and manufactured salts that contain potassium in water-soluble form) is a candidate for the same list
- N / P / K → main nutrients in inorganic fertilization
- The excessive use of chemical fertilizers → resources scarcity problems

The solution?????? .....

- ..... as P & K cannot be manufactured from alternative sources, we HAVE TO recover / reuse / recycle them…
- Sources that could be used ???

Project's Objective

Demonstrate a **Manure** and **Olive Mill Wastewater** (OMW) Managing System, which allows the utilisation of specific characteristics of these wastes, transforming their mixture, into a high nutrient containing **New Product**, which can be safely and easily be used, in all ranges of agriculture and horticulture, **REPLACING** in a significant scale inorganic chemical fertilisation

The CONDENSE process…!!!

- Combination of 2 simple & low cost waste management **technologies**

COMPOSTING **SOLAR DRYING**

- Utilizes as **raw materials** …agricultural & agro-industrial wastes

MANURES **OLIVE MILLS WASTEWATER (OMW)**

Process

Manure
Nitrogen: 25.4 kg / tn DW
Phosphorus: 16.5 kg / tn DW
Potassium: 17.2 kg / tn DW

OMW
Nitrogen: 2.2 kg / m^3
Phosphorus: 0.8 kg / m^3
Potassium: 5.5 kg / m^3
Phenols: 1.6 kg / m^3


Solar Drying Process

Pre-Product:
Nitrogen: 2.9 %
Phosphorus: 1.8 %
Potassium: 9.18 %
Phenols: 6.5 kg / tn DW


Composting Stage

End Product – Fertilizer
Nitrogen: 7 %
Phosphorus: 3 %
Potassium: 17 %
Phenols: 2.1 kg / tn DW

Final products…

from cow manure

from poultry manure

from pig manure

The CONDENSE agronomic trials..(nutrients equalization)

- Use END product as a POTASSIUM organic fertilizer

1. 100% chemical fertilization

2. 50% chemical fertilization

3. Blank

4. Without addition of chemical fertilizer

$K = K_{chemical\ fertilizer}$
$P < P_{chemical\ fertilizer}$
$N < N_{chemical\ fertilizer}$

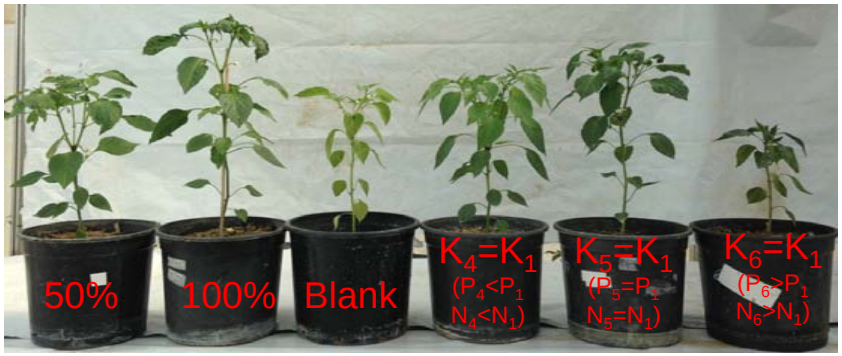
5. Addition of chemical P & N

$K = K_{chemical\ fertilizer}$
$P = P_{chemical\ fertilizer}$
$N = N_{chemical\ fertilizer}$

6. Addition of chemical P & N

$K = K_{chemical\ fertilizer}$
$P > P_{chemical\ fertilizer}$
$N > N_{chemical\ fertilizer}$

The CONDENSE agronomic trials…



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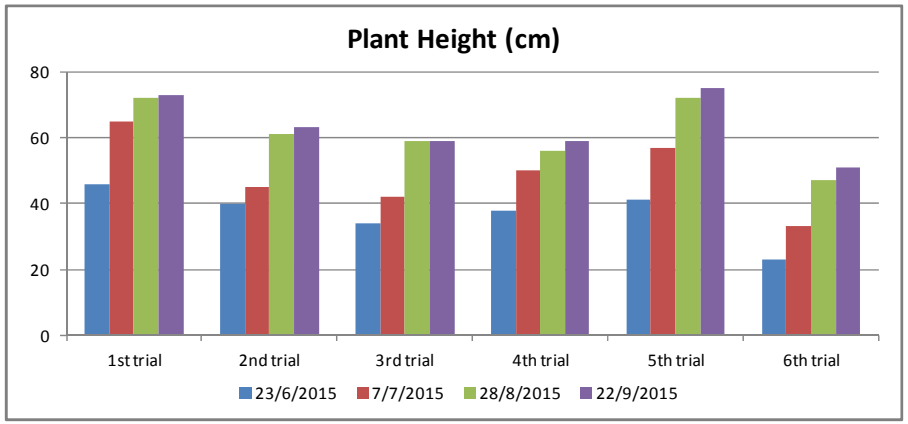
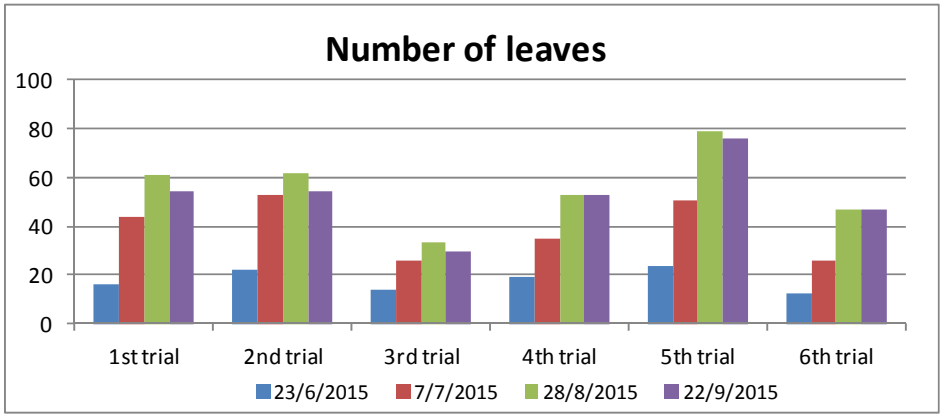
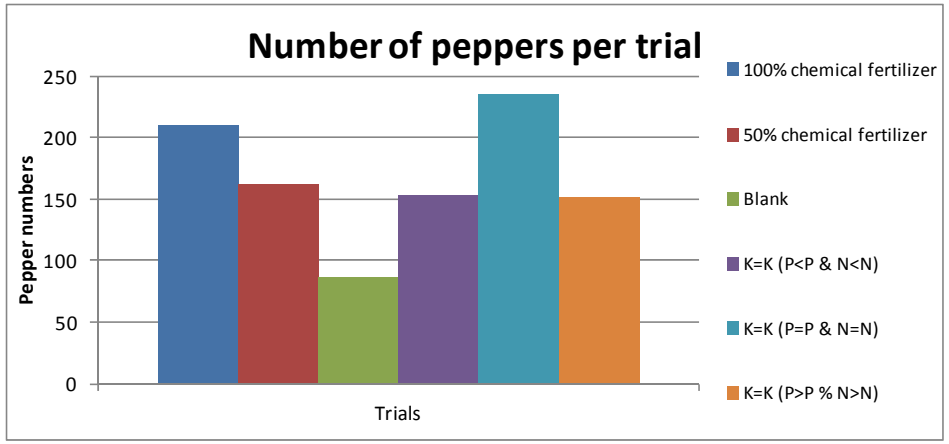
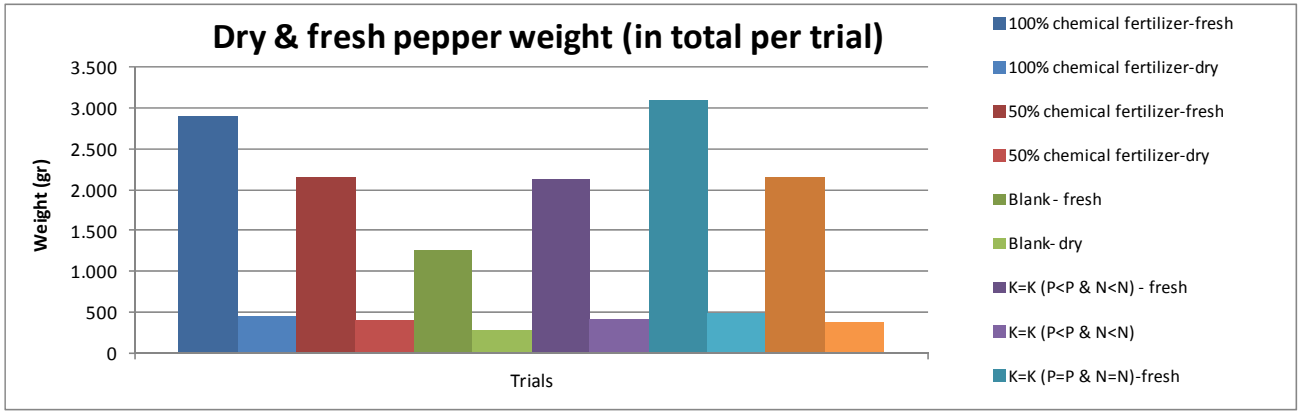




The CONDENSE agronomic trials…

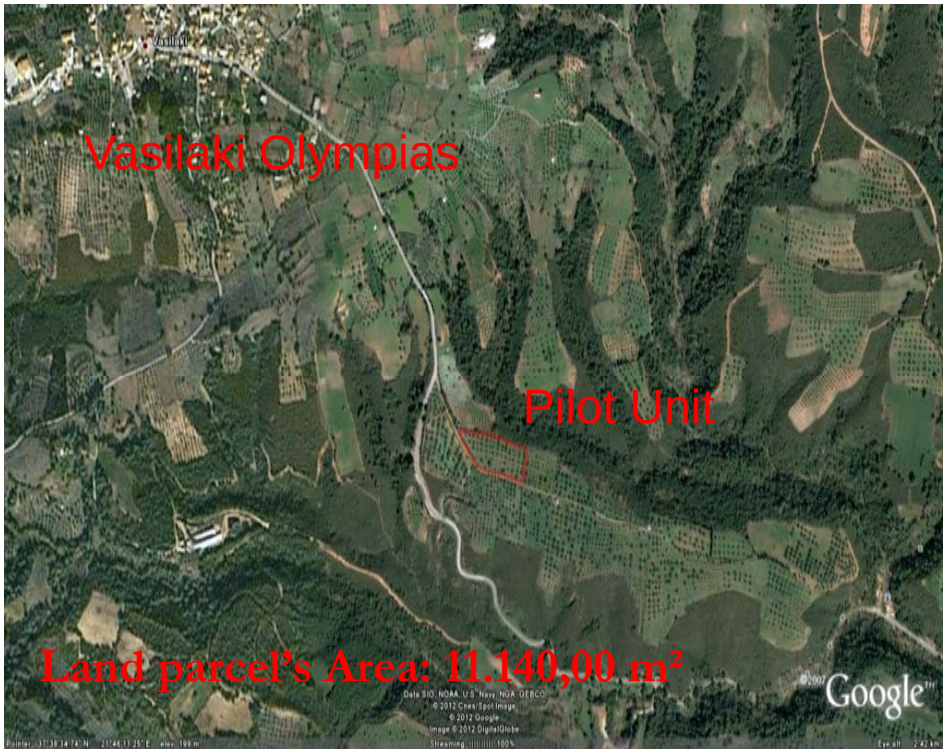


the total production in trial 5 is quiet higher than this of full chemical treatment. However, the average size of the peppers is smaller than this of trial 1. So, more peppers occurred from trial 5 but with smaller size.



Demonstration Area

Pilot Unit in Ilia, Region of Western Greece



Location: "Vasilaki" Agricultural area, Municipality of Ancient Olympia

Solar drying pilot unit

Full scale unit

- ✓ Designed for producing an organochemical fertilizer:
  - 40,000 m^3 olive mill waste water (from 8,000tn of olive oil)
  - 4,000 tn of manures (pig) w/w
  - 1,000 tn of urea (N source)
  - 300 tn P_2O_5
  - Produce 3,500 tn of N / P / K : 18-6-12

Full scale unit

- ✓ Designed for producing a organochemical fertilizer:
  - Capital cost (construction / equipment): 2.4 M€
  - Operating cost: 0,85 M€
  - Overall cost / tn (depending on the possible subsidizing of construction / development): 275 to 345 €
  - Similar products on the market wholesale price range, from 350 to 450 € / tn

Thank you for your attention!!!

Condense

Enrich your land without chemicals!

ACKNOWLEDGMENTS

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