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Title: Pyrolysis Systems for Agriculture Development and Food Security in Egypt: Conversion of Biomass to Bio-products in Egypt.



Biography: Magdy Mohamed completed his Ph.D. in Genetics and Plant Breeding (2003): Institute of Plant Breeding and Acclimatization, Radzików, Warsaw, Poland. He is Director of: Ismailia-Agriculture Research Station, ARC, Egypt. Magdy Mohamed is Egyptian Coordinator & Principal Investigator: Egypt-Finland-Projects (Two Projects). He is Principal Investigator of the project: Improvement of Small Ruminants Productivity by Providing Higher Quantity Feed in Matrouh-Governorate, Egypt. Magdy Mohamed is editor in the following three Journals: De-Witty Journal of Agricultural Sciences, International Journal of Research-GRANTHAALAYAH and International Journal of Applied Agricultural Research. Also, he is a reviewer in Science Alert. Magdy Mohamed is a member in: ICBA-International Center for Bio-ICBA saline Agriculture, IHSG-International Herbage Seed Group and NAAIC-North American Alfalfa Improvement Conference (Non-North American Scientists).

Abstract:

- The role of Field Crops Research Institute in food security measures is:
  - ✓ Develop, release and maintain high-yielding cultivars and hybrids that are resistant / tolerant to biotic and abiotic stresses.
  - ✓ Define and test agriculture practices that maximize yield potentialities of the released cultivars.
  - ✓ Strengthen co-operation with various national and international research centers and funding.
  - ✓ Adopt specialized extension and training program to transfer new technologies to farmers to increase the crops productivity.
  - ✓ In collaboration between Egypt and Finland; Egypt is implementing a new project for applying pyrolysis and bio-char systems that can be help in increasing of crops productivity under sandy soil and saline water conditions through the improving effect of some physical and chemical properties such as water holding capacity and nutrition availability.
  - ✓ Where, the results show that, the increasing population and limitations in cultivated land will strain Egyptian food security, which leads us to use the advanced technologies in agriculture and adjustment of crop structure and cropping systems to improve land utilization efficiency.
- 86-Slow Pyrolysis Cycles for agriculture wastes were done using Retort Machine:
  1. Tomato Straw (*Solanum lycopersicum* L.).
  2. Cantaloupe Straw (*Cucumis melo* L.).
  3. Remnants of Date Palms (*Phoenix dactylifera*).
  4. Remnants of Olive Trees (*Olea europaea*).
  5. Tamarix (*Tamarix nilotica*).
- The tar product liquid from tomato straw is best one as herbicide, especially, on field bindweed (*Convolvulus arvensis*)
- Biochar application reduced proline content as compared to the other treatments. Thus, we concluded that biochar application may help to increase field crops production under sandy soil and saline water conditions through the improving physical and chemical properties such as water holding capacity and nutrition availability.
- Furthermore, the seven soil amendment treatments with biochar were recorded to give positive and the highest value for net profit / fed. (N.P.F), profit from ton production (P.T.P) and profit from investor pound (P.I.P) than other treatments.
- It is worth to mention that, all of these factors increase agricultural sustainability, especially, on regions suffering from water shortages and in poor soil nutrient conditions in Sinai and Matrouh-Governorates, Egypt. However, the mechanism behind deserves further research.