KOMODITAS: JARAK PAGAR

TEEAL 2006-2008

FERTILIZING (1 JDL)

Contribution of Jatropha curcas to soil quality improvement in a degraded Indian entisol
Acta Agricultura Scandinavica. Section B, Plant Soil Science. 2008. 58 (3). 245-251
Author(s): Ogunwole-J-O. Chaudhary-D-R. Ghosh-A. Daudu-C-K. Chikara-J. Patolia-J-S
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Abstract:

Soil quality improvement is critical to any rehabilitation programme in dry land degraded ecosystems. This study reports on the impact of cultivation of Jatropha curcas with or without soil amendments on the structural stability, and carbon and nitrogen content of a degraded Entisol under rehabilitation in western India. Cultivation of Jatropha curcas resulted in 11% average increase in mean weight diameter of the soil and 2% increase in soil macro-aggregate turnover. Cultivation of Jatropha curcas with nitrogen and phosphorus- or without any-amendment improved macro-aggregate stability relative to nearby native vegetation. Regression analysis showed a significant correlation between organic carbon and mean weight diameter. The cultivation of Jatropha curcas appeared to have also contributed to the quality of these soils as it maintained organic carbon and nitrogen stock and displayed a potential to increase carbon sequestration rate. Soil structure recovery under cultivation of Jatropha curcas implies a sustainable improvement in the surface integrity of these soils, which will ensure more water infiltration rather than runoff and erosion

Descriptors: carbon; carbon sequestration; cultivation; Entisols; nitrogen; nitrogen fertilizers; phosphorus fertilizers; regression analysis; soil amendments; soil chemical properties; soil degradation; soil fertility; soil physical properties; soil structure South Asia; Asia; Developing Countries; Commonwealth of Nations; Jatropha; Euphorbiaceae; Euphorbiales; dicotyledons; angiosperms; Spermatophyta; plants; eukaryotes

FOOD COMPOSITION (1 JDL)

Chemical composition, toxic/antimetabolic constituents, and effects of different treatments on their levels, in four provenances of Jatropha curcas L. from Mexico
Food Chemistry. 2006. 96 (1). 80-89
Author(s): Martinez-Herrera-J. Siddhuraju-P. Francis-G. Davila-Ortiz-G. Becker-K
Author Affiliation: Departamento de Graduados e Investigacion en Alimentos, Escuela Nacional de Ciencias Biologicas, IPN. ZIP 11340, Mexico D.F., Mexico
Abstract:

Jatropha curcas L. is a multipurpose shrub of significant economic importance because of its several potential industrial and medicinal uses. Four provenances of J. curcas from different agro-climatic regions of Mexico (1. Castillo de Teayo, 2. Pueblillo 3. Coatzacoalcos and 4. Yautepec), that differed in morphological characteristics, were studied. The seed kernels were rich in crude protein, CP (31-34.5%) and lipid (55-58%). The neutral detergent fibre contents of extracted J. curcas meals were between 3.9% and 4.5% of dry matter (DM). The gross energy of kernels ranged from 31.1 to 31.6 MJ/kg DM. The contents of starch and total soluble sugars were below 6%. The levels of essential amino acids, except lysine, were higher than that of the FAO/WHO reference protein for a five year old child in all the meal samples on a dry matter basis. The major fatty acids found in the oil samples were oleic (41.5-48.8%), linoleic (34.6-44.4%), palmitic (10.5-13.0%) and stearic (2.3-2.8%) acids. We also found previously unreported cis-11-eicosenoic acid (C20:1) and cis-11,14-eicosadienoic acid (C20:2) in the oil. Phorbolesters were present in high concentrations in the kernels of Coatzacoalcos (3.85 mg/g dry meal), but were not detected in the samples from Castillo de Teayo, Pueblillo and Yautepec. Trypsin inhibitors (33.1-36.4 mg trypsin inhibited g-1 dry meal), phytates (8.5-9.3% of dry meal as phytic acid equivalent), saponins (2.1-2.9% of dry meal) and lectins (0.35-1.46 mg/ml of the minimum amount of the sample required to show the agglutination) were the other major antinutrients present in all the seed meals. Different treatments were attempted on the seed meal samples to neutralize the antinutrients present in them. Trypsin inhibitors were easily inactivated with moist heating at 121 deg C for 25 min. Phytate levels were slightly decreased by irradiation at 10 kGy. Measured saponin contents were reduced by ethanol extraction and irradiation. Extraction with ethanol, followed by treatment with 0.07% NaHCO3 considerably decreased lectin activity. The same treatment also decreased the phorbolester content by 97.9% in seeds from Coatzacoalcos. The in vitro digestibility of defatted meal (DM) was between 78.6% and 80.6%. It increased to about 86% on heat treatment
Descriptors: antinutritional-factors. chemical-composition. crude-protein. energy-content. essential-amino-acids. extraction. fibre. food-processing. gadoleic-acid. heat-treatment. irradiation. lectins. linoleic-acid. lipids. nutritive-value. oleic-acid. palmitic-acid. phytates. provenance. saponins. stearic-acid. trypsin-inhibitors

PLANT PHYSIOLOGY-GROWT AND DEVELOPMENT (1 JDL)

Minimum lethal temperature for seedlings of the oil seed plant
Bragantia. 2008. 67 (3). 799-803
Author(s): Andrade-G-A. Caramori-P-H. Souza-F-S-de. Marur-C-J. Ribeiro-A-M-de-A
Author Affiliation: Universidade Estadual de Londrina, km 380, Campus Universitario, Caixa Postal 6001, 86051-990 Londrina, PR, Brazil
Abstract:

The objective of this paper was to determine the minimum lethal temperature for the oil seed plant Jatropha curcas, aiming at supporting the expansion of this crop in southern Brazil as an alternative for biofuel production. The experiment was carried out at the Agronomic Institute of Parana (IAPAR), in Londrina, Parana, Brazil. In a cold chamber environment, young plants were submitted to treatments with minimum temperatures of +1, 0, -1, -2, -3, -4 and -5 deg C, and compared to a control exposed to ambient temperature. Ten plants in each test (replications) were distributed within the chamber in a completely randomized design. The following parameters were evaluated: photosynthetic rate after 6 h and 7 and 14 days; visual foliar damages one day and one month after the tests; plant mortality one month after the tests and plant recovering in the field. The minimum lethal temperature for Jatropha curcas was between -3 and -4 deg C
Descriptors: biofuels. crop-damage. fuel-crops. mortality. photosynthesis. stress. stress-response. temperature

RENEWABLE ENERGY RESOURCES (2 JDL)

Studies on characterization of selected plant oils and their bio-diesels
AMA, Agricultural Mechanization in Asia, Africa and Latin America. 2008. 39 (2). 14-18
Author(s): Gupta-P-K. Panesar-B-S. Rakesh-Kumar
Author Affiliation: School of Energy Studies for Agriculture, College of Agricultural Engineering, Punjab Agricultural University, Ludhiana - 141 004, Punjab, India
Abstract:

Bio-diesel is a renewable alternate fuel for diesel engines. Studies were conducted on bio-diesels prepared from three plant oils, namely, rice bran oil, **jatropha curcas oil**, and karanji oil. Bio-diesel was prepared from plant oils using the esterification process. Fuel characteristics of these bio-diesels (washed and unwashed) were determined for their suitability as alternate fuel for diesel engines. Most of the fuel characteristics of these bio-diesels were quite close to those of diesel. However, heat values of bio-diesels, except that of rice bran, were lower than that of diesel
Descriptors: biodiesel. biofuels. density. diesel-engines. energy-sources. esterification. fatty-acids. karanjin. plant-oils. renewable-energy. renewable-resources. rice-bran. Viscosity. Jatropha-curcas

Lipase-mediated conversion of vegetable oils into biodiesel using ethyl acetate as acyl acceptor

Bioresource Technology. 2007. 98 (6). 1260-1264

Author(s): Modi-M-K. Reddy-J-R-C. Rao-B-V-S-K. Prasad-R-B-N

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Abstract:

Ethyl acetate was explored as an acyl acceptor for immobilized lipase-catalyzed preparation of biodiesel from the crude oils of Jatropha curcas (jatropha), Pongamia pinnata (karanj) and Helianthus annuus (sunflower). The optimum reaction conditions for interesterification of the oils with ethyl acetate were 10% of Novozym-435 (immobilized Candida antarctica lipase B) based on oil weight, ethyl acetate to oil molar ratio of 11:1 and the reaction period of 12 h at 50 deg C. The maximum yield of ethyl esters was 91.3%, 90% and 92.7% with crude jatropha, karanj and sunflower oils, respectively under the above optimum conditions. Reusability of the lipase over repeated cycles in interesterification and ethanolysis was also investigated under standard reaction conditions. The relative activity of lipase could be well maintained over twelve repeated cycles with ethyl acetate while it reached to zero by 6th cycle when ethanol was used as an acyl acceptor

Descriptors: acetates. biodiesel. biofuels. enzyme-activity. enzymes. esterification. ethanol. plant-oils. sunflowers. triacylglycerol-lipase Candida. Helianthus-annuus. Jatropha-curcas. Pongamia-pinnata

PESTS OF PLANTS (1 JDL)

Effectiveness of botanical extracts from ten plants on mortality and larval repellency of Rhynchophorus palmarum L., an insect pest of the Peach palm Bactris gasipaes Kunth in Amazonian Peru

Agricultura Tecnica. 2006. 66 (1). 21-30

Author(s): Perez-D-D. Iannacone-O-J

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Abstract:

Pest resistance to chemical insecticides has grown in recent years, which is the motive for the search for alternative methods, such as plants with larvicidal activity. The objective of this research was to evaluate mortality and larval repellency of Rhynchophorus palmarum, a pest of the peach palm Bactris gasipaes, to 10 plants with biocide potential: india heliotrope (Heliotropium indicum), angels' trumpets (Brugmansia sp.), wandering jew (Tradescantia zebrina), **nettles-purge (Jathropa curcas),** soapberry (Paullinia clavigera), red spurge (Euphorbia cotinifolia), annato (Bixa orellana), golden shower (Cassia fistula), birthwort fruit (Aristolochia pilosa) and pareira (Chondrodendron tomentosum). Bioassays with R. palmarum were performed at 1, 4, 8, 12 and 24 h exposure, employing 660 larvae under laboratory conditions and aqueous

botanical extracts of the plants at a 1:3 (w/v) ratio. At 24 h exposure, the highest mortality percentage of R. palmarum was observed with birthwort fruit (73.30%: liquefied leaves and stems) followed by wandering jew (70%: liquefied leaves and stems) and pareira (60%: wood and bark in decoction). In the case of repellency, the highest effects were found in birthwort fruit (80%) followed by pareira (73.30%) and wandering jew (71.70%). In addition, nettles-purge (liquefied seeds) produced only 3.3% mortality but significantly 55% repellency. The possibility of employing these botanical extracts in integrated management of R. palmarum is analysed

Descriptors: botanical-insecticides. insect-pests. insecticidal-plants. insecticidal-properties. insecticides. mortality. non-wood-forest-products. plant-extracts. plant-pests. repellency